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THE BOND PRICE COMPETITION IMPROVEMENT ACT OF 1999

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HEARING

BEFORE THE

SUBCOMMITTEE ON
FINANCE AND HAZARDOUS MATERIALS

OF THE

COMMITTEE ON COMMERCE
HOUSE OF REPRESENTATIVES

ONE HUNDRED SIXTH CONGRESS

FIRST SESSION

MARCH 18, 1999

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THE BOND PRICE COMPETITION IMPROVEMENT ACT OF 1999

THURSDAY, MARCH 18, 1999

HOUSE OF REPRESENTATIVES,
COMMITTEE ON COMMERCE,
SUBCOMMITTEE ON FINANCE AND HAZARDOUS MATERIALS,
Washington, DC.

The subcommittee met, pursuant to notice, at 11:07 a.m., in room 2322, Rayburn House Office Building, Hon. Michael Oxley (chairman) presiding.

Members present: Representatives Oxley, Ganske, Lazio, Shimkus, Fossella, Blunt, Bliley (ex officio), Towns, Stupak, Engel, DeGette, Barrett, Luther, Capps, and Markey.

Staff present: David Cavicke, majority counsel; Linda Dallas Rich, majority counsel; Brian McCullough, professional staff member; Robert Simison, legislative clerk; Consulea Washington, minority counsel.

Mr. OXLEY. The subcommittee will come to order. The Chair would like to recognize the chairman of the full Commerce Committee, the gentleman from Richmond, Mr. Bliley for an opening statement.

Chairman BLILEY. I thank the chairman, the members of the committee, and the people who will testify. I'm very happy to see a good friend, Mr. Levitt, the Chairman of the SEC. I unfortunately have to be in two places at one time, which is a difficult thing to do at best. But, we have a hearing on electricity restructuring at 11 a.m. down in 2123, so I'll have to shuttle back and forth.

In the 105th Congress, the committee conducted an inquiry into the U.S. bond markets and we learned three things. First, the bond market in the United States is huge. The ability of trading of Government securities exceeds $300 billion; daily trading of corporate debt, about $15 billion; the daily trading in municipal bonds about $9 billion. In comparison, the average daily value of stock traded on the New York Stock Exchange is about $25 billion.

Second, the bond market offers a way for companies and cities to raise money with interest rates more favorable than those offered by banks. To the extent that companies and cities use the bond market, their cost of capital will be lower. They will be more competitive and they will save taxpayer's money. Indeed, today, in the Wall Street Journal, there's an article that AT&T may be about to raise somewhere between $6 and $8 billion in the bond market by themselves.

Third, the level of transparency in parts of the bond market is poor. Transparency needs the ability of someone buying a bond to know the price at which the bond is trading. When people buy cars or furniture, they often comparison shop and make decisions based on price. For many investors in bonds, this comparison shopping is not possible. We heard testimony in September that two investors buying the same bond at the same time from the same dealer can be given very different prices, prices differing by as much 6 percent, a full year's worth of interest.

I believe this situation is unacceptable. We have received a study from a professor at Purdue and an economist at the Federal Reserve that indicates that improved transparency will reduce spreads and improve prices to investors in the bond market. I ask unanimous consent that that study be made a part of today's hearing record.

Mr. OXLEY. Without objection.

[The study appears at pg. 42.]

Chairman BLILEY. Today, we will consider a committee draft of legislation designed to improve transparency in the bond market. It is simple legislation. It directs the SEC to adopt rules facilitating transparency in these markets with certain minimum standards in that rulemaking. The SEC will take comments from the affected parties and will come up with the best way to improve price competition in these markets.

This is an important goal for our markets and investors. Anyone using the bond market to save for retirement or education will benefit from it. Each of the witnesses has worked cooperatively with the committee to develop this bipartisan legislation. I commend Chairman Oxley for holding this hearing and for working with me on this legislation. I also commend John Dingell, Ed Towns, and Ed Markey for their cooperation in the project.

I urge all members to consider this important legislation. After the hearing, it will be revised based on the testimony we hear today. It will then be introduced. I ask all members to consider cosponsoring this legislation with me, and I yield back to balance my time. And, again, thank you, Mr. Chairman.

Mr. OXLEY. I thank the chairman and appreciate his remarks. The Subcommittee on Finance and Hazardous Materials has developed a track record of legislative accomplishments in the last two Congresses, improving our financial markets through competition. Competition forces change and change produces efficiency. Our commitment to apply these principles to the financial markets has translated into tangible results that benefit investors, as well as businesses.

Of the many accomplishments of which the subcommittee can be proud, the most notable recent examples include the decimal pricing initiative, the National Securities Market Improvement Act, reduction of stock transaction fees, and securities litigation reform legislation. The decimal pricing effort, although not fully implemented, had an immediate impact for investors and business, alike.

When the Exchanges voluntarily moved to reduce the minimum increment for trading stocks from ⅛th to 1⁄16th, individual investors and institutional investors began saving money immediately. And with the addition of twice as many prices at which to buy or sell a stock, the markets have experienced greater volume. We obviously don't take credit for the robust market volume that we've experienced over the last 2 years, but there is sufficient evidence that the move has in no way harmed market liquidity.

Our current effort to improve the transparency in the corporate bond market originates with the same philosophy: improve information, eliminate anti-competitive and regulatory barriers and greater competition will result to benefit all aspects of the markets.

When this subcommittee first examined this issue last September, the consensus was that the corporate bond market was not as transparent as other segments of the bond market. We determined that the market for these bonds could become more transparent. The more that relevant price and yield information is available, the more competition will improve. This in turn will improve prices for people buying bonds, their pension funds, and their mutual funds.

Chairman Bliley challenged the bond market participants to improve transparency of the bond market. They have responded well. On their own initiative, the private sector has devoted its own resources to develop a system to begin to shed more light on the corporate bond market. I understand that one of these initiatives is scheduled to be operational within the next 2 months. I commend them for their efforts.

Today, we are going to examine legislation to buildupon this work. The SEC has possessed the authority since 1975 to facilitate price transparency in the bond markets. The committee draft being considered today instructs the SEC to use that authority to guarantee transparency in these markets. Additionally, the committee draft sets certain minimum standards for transparency in the corporate bond market and calls for a study of transparency in the municipal market.

I commend Chairman Bliley for his leadership in this initiative. I also thank the witnesses for their constructive comments in the drafting process. I recognize Ed Towns, our ranking member, John Dingell, the ranking member of the full committee, and my friend from Massachusetts for their help and support of this legislation. We anticipate that the legislation will be refined on the basis of today's hearing and then introduced. I hope we will have the support of all members for this worthwhile legislation.

That ends the Chair's opening statement and I now turn to the ranking member, the gentleman from New York, Mr. Towns.

Mr. TOWNS. Thank you, very much, Mr. Chairman, for holding this hearing. I appreciate having the opportunity here from our distinguished witness on bond market transparency and the committee draft bill, the Bond Price Competition Improvement Act of 1999.

In 1972, Don Riggins stated in his book, A View From the Street, that at present, Wall Street is hiding behind a protective pricing system. While it preaches free competition and free market, as I mentioned in a public speech, that is like catching Carrie Nation tickling in the basement.

We say that competition is good for everyone. We base our investment advice on the competitive stance of economy we are analyzing. The price of a stock is set by the forces operative in the marketplace. Yet, we live with this anomaly of a fixed rate structure. We know there's exceptions to our own rules. Prices are arrived at by a study of cost and markup for profits. Prices change as cost rise or fall. And as the demand for the product of service changes, they react to new efficiencies, to inflationary or deflationary pressures. That's the creed. Wall Street must learn to live by it. So, I suggest that in stock trading, we crown the customer king.

In the 1975 Act Amendment, Congress abolished fixed commission rates and mandated that the SEC facilitate a national market system inequities that included implementation of a composite tape and quotation system. Twenty-five years later, we have the most transparent, efficient, liquid, fair, and competitive securities market in the entire world. The customer is king. But not so in the bond markets. Wall Street largely still lives as an exception to its own rules.

Mr. Chairman, I'm pleased that we are going to try to shed a little sunlight on those markets, as well. It is long, long, long overdue. In June of last year, the hearing on on-line trading, this subcommittee heard testimony from Mr. Fondren, that at present, no centralized exchange for bonds, current price information remains in the hands of a small group of insiders perpetuating a system that is both inefficient and unnecessarily costly.

In September, Mr. Chairman, Mr. Levitt gave a speech, calling for increased price transparency in the corporate debt market, to help investors make better decisions and increase confidence in the fairness of the markets. At this subcommittee's gala September 29, 1998, Chairman Bliley issued a challenge to the SEC and to the bond market to get going and clean up this—clean this market up. I look forward to hearing their reports this morning on what progress has been made. Both contend, in their written statements, that they are uniquely qualified to develop the system for public dissemination of bond transaction information. But, I hope we are not being asked to anoint any one system at this point. It would seem that there is room for both, if not others, as well.

I understand that the draft bill was not finished in time for the witnesses to include detailed comments on the draft in their testimony, and I understand that. So, I hope that the chairman will direct them to submit written comments and hold the record open for that purpose. I look forward to working with the chairman of the full committee and the chairman of the subcommittee. I salute you both for leadership. And, at this time, I would yield back and say to you that I look forward to working very closely with you in the days and months ahead.

Mr. OXLEY. I thank the gentleman for his opening statement. The gentleman from Iowa, Mr. Ganske.

Mr. GANSKE. Thanks, Mr. Chairman. I look forward to the testimony from Chairman Levitt and I yield back.

Mr. OXLEY. The gentlelady from Colorado, Ms. Degette.

Ms. DEGETTE. Thank you, Mr. Chairman, and thank you for having this hearing today. I, too, look forward to the introduction of the Bond Price Competition Improvement Act of 1999. I think that there are three broad economic benefits that price transparency can bring to us.

First of all, it can bolster investor protection by providing investors with better opportunities to monitor the behavior of the entities that make markets of secondary securities. Second, it can improve market liquidity by boosting investor market maker confidence in the market. Finally, it can enhance market efficiency by boosting a price discovery process of moving toward the optimal price for a particular security.

With that, Mr. Chairman, I think there are great benefits. I would commend Mr. Levitt and others through their work in this area, as well as you. And I'm so eager to hear my colleague from Massachusetts comments, which I know are always wonderful. Usually, I have to follow him when I speak, so I'll yield back the balance of my time.

Mr. OXLEY. The gentlelady bravely yields back her time, and we now recognize the aforementioned gentleman from the Bay State.

Mr. MARKEY. Thank you, Mr. Chairman, very much. And over the years, I've found that the single most difficult thing to actually have fun with is the bond market.

By definition, it's dull. I mean, it's really dull. At least with class, you get a little bit attention. But, in the bond market, it's really—it's hard, you know. It's a hard thing to talk about.

I'm so glad that we have our great Chairman of the Securities and Exchange Commission with us today; he's going to go down in the annals of the Securities and Exchange Commissions as one of the greats. If there's a Mount Rushmore, they'd be carving his picture out right now. He's at the top. So, we're very glad to have him here with us today, and you, as well, Mr. Colby. We thank you for coming.

As you know, the Commerce Committee has had a long tradition of leadership in eliminating obstacles to the dissemination of market information to investors. It goes back a long, long way. The goal has always been to ensure that the public got market information.

At the time that the 1975 Act passed, Congress added amendments to the Exchange Act, which directed the SEC to facilitate the creation of a national market system for qualified securities. When Congress enacted that legislation, it did not limit its application merely to stocks, but to all securities, including debt securities. In fact, the only type of securities that were not included were the so-called exempt securities, which had defined in the securities laws to include treasury bonds, government agency securities, and municipal securities.

At the time this legislation passed, there were many in the broker-dealer community, who opposed it. But some 24 years later, the Dow Jones industrial average is pleased to top 10,000 mark and all observers agree that our stock market are much more efficient and more liquid, in large part due to their increased transparency.

Over the years the SEC has not made much use of the powers Congress granted to it in this area to bring transparency to the corporate bond market. A decade after passage of the National Market System legislation, this committee also became concerned about the inadequacy of price transparency in the government securities market. Those concerns ultimately led the committee to include in the Government Securities Act of 1986 a provision mandating a General Accounting Office study of the matter. The GAO's final report in 1990 called for Federal regulation of price transparency in the government bond market. Based upon this recommendation, I crafted legislation, which would have extended the SEC price transparency authority to the government market.

But this provision had to be dropped from the final version of the Government Securities Act Amendments of 1993, due to the intense opposition of the government bond dealers. Instead, the committee mandated that the SEC include, in its annual report to Congress, a requirement that the SEC analyze the report on the nature and adequacy of price transparency in the government securities market, and on any remedial legislation needed to address any future deterioration in investor access to market information. I look forward to hearing from Chairman Levitt this morning regarding the SEC's administration of this reporting provision.

But the principle reason we are meeting here today is to review new draft legislation, which would direct the SEC to use the authorities Congress granted it back in 1975, to issue rules within 12 months to improve price transparency in the corporate bond market. I support this initiative, because I believe that bond investors deserve to get full access to the type of market information that will better enable them to determine whether they are getting the best price for their buy and sell orders.

I know that Chairman Levitt has already taken some preliminary steps to move the industry forward in this area and that, as a result of his leadership, the NASD is currently considering rule changes that would create transparency in audit trail systems for the corporate bond market. In addition, I understand that the Bond Market Association has also stepped in with a plan to make certain market information available. I welcome each of these initiatives and would suggest that the legislation we are reviewing today should be seen as complimenting these efforts.

I look forward to the testimony of the Chairman and our other distinguished witnesses. And Mr. Chairman, I congratulate you on the vigor with which you are continuing to pursue your chairmanship, looking into areas in which we can move on a bipartisan manner, to ensure that the market works in a more transparent fashion. And I thank you.

Mr. OXLEY. I thank the gentleman from Massachusetts. And try, as he might, to make the bond issue a little more sexy, you failed just a little bit.

But, that was a good try. It was kind of like Boston College trying to get into the NCAA tournament, but that's another story.

The gentleman from Missouri.

Mr. BLUNT. Of course, the Southwest Missouri State Bears play Duke tomorrow in the NCAA and after that 30 point win on Tennessee, which was harder to predict than anything in the bond market, I think Mr. Chairman, I'll just listen today.

Mr. OXLEY. I thank the gentleman. The gentleman from Long Island.

Mr. LAZIO. Once again, thank you for your interest and commitment and drive on this. And although we've had some disagreements in the past, I can say now, I think you were more right than I was. I look forward to the rest of the hearing. Welcome, my witnesses.

Mr. OXLEY. Did the reporter get that down?

The gentlelady from California.

Ms. CAPPS. Thank you. Thank you, Mr. Chairman. I'm a new member to this Subcommittee on Finance and Hazardous Materials and I can't think of a more fitting introduction to the committee than to hear the testimony today from the Honorable Arthur Levitt and from Mr. Robert Colby. So, I look forward to your presentation. Thank you, very much.

Mr. OXLEY. Thank you and welcome to the subcommittee. The gentleman from the upper peninsula.

Mr. STUPAK. Thank you, Mr. Chairman. I'll pass on the opening statement and look forward to our witnesses. And thanks for holding this hearing.

Mr. OXLEY. I thank the gentleman. We now turn to our distinguished Chairman of the Securities and Exchange Commission. We appreciate, as usual, Chairman Levitt, your participation in this debate; and Mr. Colby, welcome, as well. We were honored to visit the SEC at your request. I think speaking from all the members and staff who attended, it was the most worthwhile opportunity to learn more about what goes on over there and to understand fully the major responsibilities that you have and that you've done so well in carrying out. So, thank you and you're welcome to begin any time.

STATEMENTS OF HON. ARTHUR LEVITT, CHAIRMAN; AND ROBERT L.D. COLBY, DEPUTY DIRECTOR, DIVISION OF MARKET REGULATION, SECURITIES AND EXCHANGE COMMISSION

Mr. LEVITT. Thank you, very much. I am accompanied by Bob Colby, who is the Deputy Director of the Division of Market Regulation and an absolutely essential component in dealing with the many complex issues that division deals with, in our effort to see to it that competition in our markets is both fierce and fair.

Let me say at the outset that I support the draft bill, the Bond Price Competition Improvement Act of 1999, which directs the Commission to use its existing authority to bring transparency to the corporate debt market. By adding the weight of congressional action to that of the Commission, I think the bill sends a strong message throughout the marketplace as to the importance of this initiative. I know that your intent is not to constrain prompt Commission action in any way. There is a provision within the bill that we have some reservations about, but I know we're working closely with the committee staff to resolve that issue.

Again, as I said in my speech last fall and previous testimony before this subcommittee, I think the time has come—it's probably long overdue—to illuminate this needlessly dark corner of the Nation's capital markets. Clearly, the technology now exists to address this issue, to gather transaction prices, to distribute them, and probably most importantly to interpret them in a timely, accurate, and efficient fashion.

Today, the bond market touches just about every aspect of our lives, from the cost of building schools and hospitals to corporate investments in plant and equipment. It impacts the assets of public and private pension funds, and it channels funds to mortgages, to car loans, and a whole universe of activities important in our day to day lives.

The increase in the significance of the bond market is due, in part, to its absolutely phenomenal growth. Since 1990, corporate bond issuance has increased more than fourfold; and, for high yield bonds, more than tenfold. In effect, movements in the bond market represent a daily vote on the part of investors throughout the world, in terms of America's economy. As you see prices go up and down, it's nothing less than a reflection of that vote, which takes place minute by minute. With $2.4 trillion outstanding, the corporate debt market today is nearly twice the size of the municipal debt market and almost 70 percent as large as the outstanding treasury market.

Yet, even in the light of this very impressive growth, the corporate debt market has failed to keep pace with the transparency improvements that have taken place in our other markets, including, as Mr. Markey noted, in the government and municipal bond markets. Some corporate bonds are traded by interdealer brokers. But transaction prices, even for interdealer transactions, are certainly not displayed, nor are they reported in an organized way. Other transactions are not even reported at all. And without a trading desk and a sophisticated research department, it's nearly impossible to gather and to interpret market data.

Investors, who lack the resources at their disposal, are really left with incomplete information. And as far as I'm concerned, incomplete information leaves investors vulnerable. And that, I think, is unacceptable. Guesswork can never be a substitute for readily available pricing data. Because bond values are often closely related, the price of one bond can very often give us important information about other comparable bonds. And that's why I think comprehensive price transparency is so absolutely crucial.

Last fall, the Commission asked the NASD to adopt transaction reporting rules for corporate debt and to develop systems to collect and redistribute transaction prices on an immediate basis. We, also, requested that the NASD create a data base of transactions and a surveillance program to better detect fraud in the corporate debt market. In response to that, the NASD has formed a committee of market participants. It's called the Bond Market Transparency Committee, and their mission is to develop an industry guided proposal that will increase price transparency and oversight for the corporate debt market. We expect to see this proposal before the end of the summer. It will, I hope, lead to transaction reporting for corporate debt, improving transparency as pricing data is distributed to the public. In addition, we expect that the NASD's efforts will lead to improved surveillance for the market.

The Bond Market Association is also developing a proposal for collecting or disseminating transaction information from interdealer brokers, but only investment grade corporate debt securities up to now. A lot of the details of that proposal and its relationship with the NASD's initiative are still unclear. I absolutely welcome industry support for increased transparency. And I certainly commit to working closely with the Bond Market Association, as we look forward with our initiative.

Today, market information moves at the speed of light. The availability of accurate information to ensure the long-term viability of our markets has never been more important. Transparency is more significant, more effective than almost any regulatory fix. The corporate debt market is certainly not immune from these realities. And without reform, I believe that its current strength cannot guarantee its future prominence in an increasingly, and fiercely, competitive global market. I'm encouraged by the progress that we have seen since last fall. I'm encouraged by a cooperative spirit in both the public and private sector that appears to characterize this initiative.

A concensus is developing, and I believe that NASD and industry action will demonstrate that seeking timely and accurate pricing information is both feasible and practical. Transparency leads to fair, more efficient, and clearly more effective markets. That's in the interest of investors. It's in the interest of our markets, dealers, and our economy as a whole.

I thank the committee.

[The prepared statement of Hon. Arthur Levitt follows:]

PREPARED STATEMENT OF HON. ARTHUR LEVITT, CHAIRMAN, SECURITIES AND EXCHANGE COMMISSION

Chairman Oxley, Representative Towns, and Members of the Subcommittee: Thank you for giving the Securities and Exchange Commission ("Commission") the opportunity to present its views on an issue in which we are actively engaged—enhancing transparency in the United States debt market. Today, I'd like to focus on three topics: (1) how transparency promotes fairness and efficiency in the U.S. capital markets, and how regulatory surveillance bolsters investor confidence in those markets, (2) why we believe this is the right time for improved transparency in the corporate bond market, and (3) the progress that has been made in this area since the Fall of last year, when I testified before you about the need to improve corporate bond transparency.

I. REGULATORY GOALS OF ENHANCED TRANSPARENCY AND MARKET SURVEILLANCE

Transparency

The Commission has long believed that transparency—the extent to which prices are visible and understandable to market participants—plays a fundamental role in promoting the fairness and efficiency of U.S. capital markets. Despite differences between the debt and equity markets, the Commission believes that transparency is just as important for bonds as it is for stocks. Indeed, because the value of a bond is usually closely related to the value of other bonds, the price paid for one bond may be important information about the value of many other bonds.

In order to make informed decisions, investors must know the prices recently paid for debt instruments generally, as well as for the specific bonds they hold or that are being offered in the market. Often, there are no recent market prices for the bonds an investor holds, and their value must be imputed from the prices of other bonds. *Comprehensive* price transparency is therefore critical to informed investment decisions. Informed investors, armed with accurate information, ensure that market prices represent fair values. And fair market prices, in turn, ensure that the markets perform their economic function of efficiently allocating capital resources.

Because transparency increases the fairness and efficiency of markets and fosters investor confidence in those markets, it has the added benefit of encouraging greater participation by investors. This participation means more trading, more market liquidity, and perhaps even new business for bond dealers. Thus, we believe that a sound and sensible approach to bond market transparency will benefit almost everyone—investors, dealers, and the economy as a whole.

The Commission has a long history of supporting price transparency. When Congress adopted the 1975 Securities Act Amendments, it gave the Commission substantially greater authority over quotation and transaction reporting. Since then, the Commission has pressed repeatedly for increased transparency in equity markets. Each time opponents have predicted doom, and each time the results have shown that more transparency leads only to more liquid and efficient markets. Recent experience in the debt markets has reinforced the Commission's belief in the benefits of price transparency.

For example, in 1991, with encouragement from the Commission and Congress, the industry created GovPX, an electronic reporting system, to distribute real time quotes and transaction prices for U.S. Treasury securities. Treasury markets today exhibit an extraordinary combination of high liquidity and low transaction costs. Trading volume has increased from $111 billion per day in 1990 to $227 billion per day in 1998, and the spreads for benchmark bonds[1] are near zero.

In 1995, again with the Commission's encouragement, the Municipal Securities Rulemaking Board ("MSRB") began collecting the details of dealer-to-dealer transactions in the municipal bond market and distributing daily summary reports. In August of last year, with Commission approval, the daily reports were expanded to include customer trades as well as interdealer trades. Most recently, just last November, the Bond Market Association began offering daily summaries on its Internet Web site, making municipal bond prices for the previous day available for the first time to the general public. This new Web page received 17,000 hits in its first three weeks of operation, suggesting a high level of interest by the public.

Although we view the MSRB transparency program as a successful effort, the full impact of transparency in the municipal market will not be clear until trade reporting is done on a real-time basis, which the MSRB has committed to do and which we continue to support.

In retrospect, we believe the government and municipal securities market transparency initiatives demonstrate both the benefits of price transparency in the debt markets, and the wisdom of being sensitive to the specific qualities of each market. The Commission's corporate bond transparency initiative will be carried out in the same spirit, seeking to further transparency goals in a manner uniquely tailored to that market.

Regulatory Surveillance

Market surveillance, like transparency, is a fundamental means of promoting fairness and confidence in markets. In fact, the two go hand-in-hand. Transparency promotes fairness and efficiency by making essential information available to all market participants, assuring that market decisions are based on appropriate information. Surveillance efforts, in turn, are designed to promote fairness and investor confidence by detecting and preventing fraudulent practices, such as market manipulation, and other potential abuses. Surveillance and transparency efforts, in essence, unite to provide a comprehensive program for protecting investors and promoting the effectiveness of capital markets.

Effective market surveillance systems require that comprehensive trade information be reported to regulators. This reported trade information is subsequently used to produce audit trails and other sophisticated market surveillance tools. The key to meaningful surveillance is regulatory access to comprehensive trading information, essentially the same information that is required for price transparency.

Today, no regulator has routine access to transaction information for the broad universe of corporate bonds and preferred stocks. Consequently, there is no organized system for routine surveillance of trading in that market. Regulators must depend on examinations of broker-dealers, or react to complaints brought by investors, which are cumbersome tools. A system of comprehensive trade reporting will permit the creation of a regulatory database and appropriate tools for proactive supervision of the corporate debt markets.

II. IMPORTANCE OF U.S. DEBT MARKETS

Recent Growth

We encourage this focus on the corporate bond market now, because in recent years it has grown in importance, but not in openness. In 1985 the corporate bond market, measured by outstanding debt, was smaller than the municipal bond market. Today, at $2.4 trillion outstanding, it is about $1 trillion larger than municipal debt. It is also about 70% as large as the outstanding Treasury debt. Corporate bond issuance has increased more than four fold since 1990, and for high yield bonds, more than ten fold.

Corporate Bond Transparency

Despite its unprecedented growth, however, the corporate debt market has failed to keep pace with transparency improvements in other markets, including the government and municipal bond markets. Timely and accurate pricing information on the broad spectrum of corporate bonds is not available to the public or even to market participants. Some corporate bonds are traded by interdealer brokers, but transaction prices, even for interdealer transactions, are not displayed or reported in an organized way. As a result, in order to obtain accurate valuations of corporate debt instruments, corporate bond market participants must have a trading desk and a research department with sophisticated analytical tools to gather and interpret market information. Generally these kinds of resources are available only to large broker-dealers and institutional investors.

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[1] Benchmark Treasury bonds are generally considered to be the most recent issues of two, five and 10 year Treasury notes, and the most recently issued 30 year Treasury bond.

The time has come to illuminate this needlessly dark corner of the capital markets. The technology now exists to gather transaction prices, distribute them, and interpret them in a timely, accurate, and efficient manner. Developing such a mechanism seems the next logical step.

III. CURRENT INITIATIVE

The initiative started last Fall to improve corporate debt transparency is moving forward. As we testified in September, we have asked the NASD to adopt transaction reporting rules for corporate debt, and to develop systems to collect and redistribute transaction prices on an immediate basis. We also requested that the NASD create a database of transactions and a surveillance program to better detect fraud in the corporate debt market.

The NASD subsequently formed a committee of market participants—the Bond Market Transparency Committee --to work toward an industry-guided solution that will increase price transparency and oversight for the corporate debt market.

The NASD was asked to take on this initiative for two reasons. First, the NASD is the self-regulatory organization for the over-the-counter market, where almost all corporate debt transactions take place. While the NASD is already responsible for surveillance of this market, it generally lacks access to the market information needed to do so effectively. Second, the NASD already has in place much of the required infrastructure. For example, the NASD has a national network that collects transaction reports in Nasdaq and listed securities traded over-the-counter. It performs on-line comparison and reconciliation of those transactions, and redistributes the reported information to vendors and to the NASD's regulatory subsidiary, NASDR. We believe that much of this technology is adaptable to the corporate debt market and will obviate the need to "reinvent the wheel." Finally, the NASD will be able to create systems that combine trade reporting and comparison that will further the industry's goal of T+1 settlement, which is also supported by the Commission.

The NASD, and the industry committee it formed, are working toward a proposal for market transparency tailored to the unique features of the corporate bond market. We expect to see such a proposal before the end of the summer. We expect that the proposal will lead to transaction reporting for corporate debt that will improve transparency as pricing information is distributed to the public. Similarly, we expect that the NASD's efforts will also lead to improvements in its surveillance of the market.

The Bond Market Association ("TBMA") is also developing a proposal for collecting and disseminating transaction information from interdealer brokers, but only in investment grade corporate debt securities. While the details of that proposal and its relationship with the NASD's initiative are still unclear, we welcome industry support for increased transparency. We believe that TBMA's efforts will, at a minimum, demonstrate the feasibility of immediate price reporting in the corporate debt markets.

IV. CONCLUSION

In conclusion, the Commission believes that we are making strides toward greater transparency for corporate bonds. Transparency is both feasible and practical, and it will lead to fairer, more efficient and more effective markets. Almost everyone will benefit—investors, dealers, and the economy as a whole.

Thank you. I would be happy to respond to any questions you may have.

Mr. OXLEY. I thank the Chairman for his statement and I recognize myself for 5 minutes for questions.

Let me begin by asking, Chairman Levitt, as you know, the SEC has had the authority to improve transparency in corporate debt since the 1975 Act. Why do you think over the years that that has not been pursued aggressively on the part of the SEC?

Mr. LEVITT. Well, it hasn't been for lack of interest. When I first came to the SEC, our top priority, at that point, was beginning to look at our debt markets, particularly our municipal markets, because we felt that, at that point in time, that market almost totally lacked transparency. But the vast number—the growing number of retail investors in that market were absolutely operating in the dark. It was almost like an oriental bazaar: individuals didn't know what they were buying, what they were paying, whether the bonds were rated or unrated. And there was a culture of pay to play, which characterized the way dealers got that business. So, we spent several years addressing that issue.

But, it is clear from that time that our debt markets require additional attention. And I guess the shortest answer to your question would be in terms of priorities. We never felt that this was a low priority, but we felt that other issues really required our attention, at that point. And, frankly, the initiatives in the municipal market and the way the industry worked closely with us to attain our goals in that regard have set the stage for this initiative; I think it makes a concensus solution much more likely. And, although I share your desire to have attained this 5 or 6 years ago, I think we will attain it more comprehensively and more completely, at this time, as a result of a lot of the work that has been done in the past.

Mr. OXLEY. I appreciate that. Of course, 1975 was long before your tenure began anyway and, obviously, there was, even going back into the 1970's and into the 1980's, very little interest in this subject. I think probably other than Ed Markey, there was very little interest on the Hill, as well. We appreciate your efforts in working with us toward a better good.

Mr. Chairman, should investors have to pay for market data on bonds?

Mr. LEVITT. This service is so important, such a significant benefit to investors, that we simply have to find a way to fund providing that service. And that means that various vendors, various dealers are going to have to account for some of the resources for providing that service. Now, as to whether investors pay directly, I mean, that's an open question, at this point. But, I think that it does have to be paid for and it does have to be provided. Now, I think there are resources in the community to provide that service.

Mr. OXLEY. Do you support giving investors bond prices at real time? There's some argument that doing so may affect liquidity.

Mr. LEVITT. I think that transparency is good for liquidity. I reject the notion that it is bad for liquidity. I think a market that is open, transparent, available to anyone who wants to access that market is a market that throughout the history of markets has attracted the greatest amount of interest. I believe that, while real time is a goal, it's certainly one that is realizable, and I am supportive of moving in that direction.

Mr. OXLEY. Do you support the increased transparency for bonds issued by government-sponsored entities, or should they be, because of very unique nature, be the only ones that shouldn't be required to provide more transparency?

Mr. LEVITT. I think we have to look very carefully at that. I think clearly what GovPX did for treasuries was something very important, in terms of public good. And certain aspects of the government market, I think, are attracting greater and greater public support and involvement. We have to consider that area, as we move forward.

Mr. OXLEY. Thank you. The gentleman from New York.

Mr. TOWNS. Thank you, very much, Mr. Chairman. Chairman Levitt, on the next panel, the Bond Market Association will testify that an industry-sponsored solution is the best way to enhance transparency in the bond markets, but this market-based solution should be assessed before regulatory response is determined or mandated, and that the Association believes that legislation mandating regulatory action is unnecessary and unwanted, at this time. Do you agree or disagree with that?

Mr. LEVITT. You know, I think that industry solutions are always the ones that we try to be mindful of, and, wherever possible, the Commission works closely with the industry. It's an industry, after all, that I came out of and spent most of my life in. And, in general, I think the industry has a significant contribution to make, particularly in this area. But, the legislation doesn't obviate that fact. The legislation asks the Commission to more forward with its rulemaking process and covers areas that the industry solution does not presently address.

The industry is dealing in the present iteration of that solution with highly rated, very liquid bonds. And I think, with retail investors moving into other aspects of the corporate debt market, we have to extend beyond that area. It's terribly important that we cover all areas. And I think it would be a mistake to hold up our approach in favor of waiting for the industry or, for that matter, holding up the industry to wait for us. We're going to move as quickly as we can. I hope that the industry will move with us. But, I think we both have the incentive, as a result of this legislation, to move expeditiously and get this behind us.

Mr. TOWNS. Thank you. The committee draft includes language requiring the SEC to take into consideration the effectiveness of private sector initiatives. In your determination about whether rules or other actions are necessary, do you agree with the need for such an assessment?

Mr. LEVITT. I don't think that has to be placed in the legislation. I think if you trace the history of the Commission, in terms of its dealing with the industry that we regulate, our history shows that we work closely with them. We're not operating in a vacuum. I'm concerned that, the way that language is worded, it could indeed force us to wait for an industry solution. I think that should be left to our working with the industry and seeing to it that the two of us move as expeditiously as possible.

I'm told that the language in its present form might be an impediment. And why place it there, unless you're fearful that we wouldn't do that? I would assure you that, as we always do, we will be consulting with all the parties and all our constituents that have an interest in this area.

Mr. TOWNS. Well, I'm happy to know that you indicated you will be consulting and talking here, because I think that the chairman raised an issue, in terms of sort of who would pay for the service.

And, of course, I think all these are issues that really have to be talked about a great deal before anybody can move forward.

Mr. LEVITT. Absolutely.

Mr. TOWNS. At this time, I yield back, Mr. Chairman.

Mr. OXLEY. The gentleman yields back. The gentleman from Missouri.

Mr. BLUNT. Thank you, Mr. Chairman. Let me pursue that just a little bit more, Chairman Levitt. What about the idea of paying the market-based solution? Is there any reason that we should be concerned about the industry making a profit from market data? Is that going to dramatically impact, in your opinion, the wide access to that data? Do you think we ought to be thinking about that, as we craft this legislation? Or do you think that there likely is competition going to mean that the data is going to be available in an affordable and easy way? Or just talk to me a little bit more about that.

Mr. LEVITT. Well, this is part of an issue that goes far beyond this bill. This goes to the whole issue of how market data is gathered and disseminated, how it should be funded, who should fund it.

I think we have to take a step back and analyze our whole regulatory system, which is predicated on the cooperative efforts of the self-regulatory organizations, the Commission, and private rights of action. Without all three of those bodies, I can say to you that we simply would not be able to protect investors, as effectively as the system has protected investors for the past 65 years.

The self-regulatory organizations have established a substantial network of services that include testing, surveillance, and enforcement efforts. The NASD has built a very commendable and effective regulatory mechanism. And you have to ask yourselves what is the best method of paying for that. Clearly, their membership, through dues and fees and services, have to pay the bulk of it. And if we take away a substantial portion of the revenues from any of those entities, what would happen to them?

When I was the Chairman of the American Stock Exchange, nearly 60 percent of our revenues came from providing data. Now, you may say to me, well, that's crazy. Who wants to run a business based upon that? That's not your mission. And I'd say I worried about it and worried about it a lot, because I felt that, if we ever came to the day when that source of revenue was not there, I didn't know what we could do. So, if you take away that money from one of the exchanges, clearly somebody, some institution, some entity is going to have to make up the difference. They'll have to develop other charges, and some subsequent SEC chairman will be sitting here answering the question of why do you allow those charges to be imposed upon this or that participant in the marketplace.

I don't really know the answer to it. I understand that we're going to have hearings at some point on this subject. And I've written a letter to all of the institutions that provide this service, telling them that we are in the process of analyzing it and coming back with recommendations. And I'd like to complete this rather long winded response to your question by saying that we are addressing the issue, which is complex, and we look forward to working closely with this committee, as we try to reach some reasonable conclusions.

Mr. BLUNT. Certainly, your experience at the American Stock Exchange would indicate that the industry providing data and providing it at a cost has worked effectively?

Mr. LEVITT. Yes.

Mr. BLUNT. The only other question I've got, just on the whole issue of implementation. I know that more than 20 years ago, the SEC was given authority to work to make corporate debt more transparent, has decided that wasn't necessary. This is, I think, a little more directed. But, more importantly, just for my view on this, you do think this is important and if we pass this legislation, would move toward the goal of transparency?

Mr. LEVITT. I absolutely commit to it. I commend the sponsors of this initiative. I think it's probably long overdue. And I commit to working closely with the committee and being sure that this is reality, as quickly as possible.

Mr. BLUNT. Thank you, Mr. Levitt. Thank you, Mr. Chairman.

Mr. OXLEY. I thank the gentleman. The gentlelady from Colorado.

Ms. DEGETTE. Thank you, Mr. Chairman. I'd like to follow up, Chairman Levitt, on an issue that Mr. Towns talked to you about, which was the industry's voluntary initiative to collect price data on certain bonds and they disseminate the data to the public and regulators. And you talked a little bit about that. I'd like to hone in a little bit more specifically and ask you to address two aspects of that.

First of all, how effective do you think the industry can be, in monitoring itself, in collecting price data on investment corporate bonds from interdealers?

And then a second and related question is that how do we know—and this might be a better question for the panel following it, except I have to leave, so I'll ask you to opine and then maybe when they testify, they can tell us—tell my staff or something. But my second question is how can you be confident that dealers will actually participate, in a meaningful way, in some kind of voluntary program?

Mr. LEVITT. Well, I think the industry is really capable of doing this. The Bond Market Association, which is coordinating the industry effort, is the same group that worked closely with the Commission, in our municipal initiative. And I think the genius of the creation of this bill, mandating the Commission to move forward on this, I think will really catalyze the industry to rapidly bring to closure their part of this and hopefully carry it beyond their present inclination. So, I think the combination will work very well.

Ms. DEGETTE. I thank you. I don't have any other questions.

Mr. OXLEY. Thank the gentlelady. The chairman of the full committee is recognized.

Chairman BLILEY. Just a couple of questions, Mr. Chairman. Information is a public good, so why should exchanges or dealers be able to cross subsidize other parts of their business to profits from market data?

Mr. LEVITT. Well, the providing of market data is something that has concerned the Commission, and, indeed, about 2 weeks ago, I sent a letter to all self-regulatory organizations that were providing that data. As I mentioned earlier in my testimony, that data represents a substantial part of the revenues of some of these institutions: 15 percent in the case of the New York Stock Exchange, a substantial part for the American Stock Exchange and the Pacific Stock Exchange. And we are studying this issue and going to come up with recommendations, as part of a much broader package.

But, because the numbers involved are so considerable, we have to decide collectively with the self-regulatory organizations how they can fund themselves. If they don't get it from this source, where will they go to get those funds to provide the all important investor protections that they are providing? I mentioned before that we will work very closely with the committee, as we work through a study with the industry to determine what fair pricing would be and how that pricing is related to the actual cost of providing that information and what other sources of funding the industry can develop to see to it that they are viable institutions in doing their self-regulatory jobs.

Chairman BLILEY. Well, that's reassuring that you will have some guidelines, at least, to somewhat relate the cost of providing the information with the cost that they charge.

Will improved transparency improve price competition among bond dealers?

Mr. LEVITT. I think it will. I think improved transparency creates the kinds of markets which will attract more and more public attention, and more transparency, I think, by virtue of competitive pressures, will improve pricing, as well.

Chairman BLILEY. Thank you, Mr. Chairman. And thank you, Mr. Chairman. I have no further questions.

Mr. OXLEY. I thank the gentleman. The gentleman from Michigan.

Mr. STUPAK. Thank you, Mr. Chairman. Just a question or two, Mr. Levitt. Maybe you could help us a little bit on the bill that's been introduced, and I know you said you support it. In plain English, could you help me out a little bit on page two? They go in there and they say, "Action required, the Commission shall adopt rules and take such other actions." It goes on to say, "To assure the prompt, accurate, reliable, and fair collection, processing, distribution, publication, transaction information, including the last sale data, with respect to covered debt securities, so that information is available to all exchange members, brokers, dealers, securities information processors, and other persons."

And then they bracket it. And it's my understanding you have some concerns about the bracketed language in—from the brackets on line 19 to 24. Are you suggesting some alternative to the bracketed language? Can you break that down for me?

Mr. LEVITT. My concerns about that language are that it could be interpreted that the Commission would have to defer addressing this issue for a solution by the private sector. I mentioned before that, on any of our regulatory initiatives, we work very closely with the private sector. And I think all of us feel, judging by the statements that I've heard this morning, that this is something we should approach expeditiously. The private sector solutions that have been recommended thus far, I think, are commendable, move in the right direction, are not as comprehensive as we would like it, and are limited to only one part of the market. I believe that this initiative should carry to other parts of the market.

Now, for instance, the high yield market, is part of the market that more and more retail investors are getting into. It's obviously a part of the market that holds greater risks than the other ends of the market. And, because of that, I think we've got to look very carefully at that. We can't leave the high yield market totally out in left field.

So, I guess my feeling is that we will accomplish everything that is intended to be accomplished by this paragraph. But by casting it in stone, in a piece of legislation, I believe it defies our expediting the process. I'd like to ask Mr. Colby to comment on this, as well, if I might.

Mr. COLBY. Sure. We think the bill would be better without the paragraph included. If you decide to go forward——

Mr. STUPAK. The bracketed part?

Mr. COLBY. That's right.

Mr. STUPAK. It would be better without the bracketed part?

Mr. COLBY. That's right, because it raises ambiguities and we think that it's something that we don't need in order to do the job we're planning to do, that we've said we would do. We have some language, if the committee decides to keep something similar to the bracheted language, that would reflect that. One of our goals is not just to create a data base, but it's also making sure that the market can be monitored. So, we need to take into account surveillance, and to be able to create a surveillance data base, as well.

Mr. STUPAK. And any suggested language you have, I'm sure, any member on this committee will be receptive, at least take a look at it.

Can I ask you, Mr. Levitt, then, on page three, because you said you didn't want to leave anything out in left field, and page three, I think line five, starts, "Covered debt securities." And they say, "covered debt securities" and then they say, "exempted securities." So, what securities are carved out by the exempted securities and should they be and what securities might the SEC carve out by its grant of exempted authority?

Mr. COLBY. Exempted securities are treasury securities, agency securities issued by Fannie Mae, Freddi Mac, and others, and municipal securities. Municipal securities are covered by a separate scheme under the Act. Treasuries are typically covered by a separate scheme also. And agencies are covered, at this point, by page three of the bill. It's a technical issue—it may be covered by another provision.

Mr. STUPAK. Well, should they be carved out? Should they be accepted?

Mr. COLBY. For agency securities, the straight bonds that are issued by Fannie Mae and others are already covered very well by the existing GovPX system. What's left is mortgage pass through securities and collateralized mortgage obligations, which are quite complicated, in order to cover everything in this process.

Mr. STUPAK. Could I just ask him to follow up my second part of the question? Are there any securities that the SEC might want to see carved out?

Mr. COLBY. I believe the reason that this is written the way it is, is so that if, after consultation with the industry, there are securities that immediate disclosure creates problems for, this would give us the authority to carve those out.

Mr. STUPAK. Thank you.

Mr. OXLEY. The gentleman's time has expired. The gentleman from Statan Island.

Mr. FOSSELLA. No questions.

Mr. OXLEY. The gentleman from New York.

Mr. ENGEL. Thank you, Mr. Chairman. How come you said Statan Island for him and you didn't say Bronx and Westchester for me?

Mr. OXLEY. I choked. I couldn't remember.

Mr. ENGEL. Thank you. Chairman Levitt, first of all, let me say that—let me thank you for the job that you do and thank you for your accessibility. There has not been a time when I've called you that you haven't gotten back immediately, and I know every on the committee feels the same way. So, I wanted to just say that publicly, I really appreciate it.

You spoke, in your testimony, you talked about corporate debt transparency. And I'm just wondering, is that where you see the most trouble or the most difficulty nowadays? Is it lack of transparency? Is it the corporate debt problem?

Mr. LEVITT. Well, if I began to assess priorities, in terms of what's going on in the markets, I'd have a pretty long list. But, almost every issue that would be on that list are issues that could be enhanced by virtue of increased transparency. And what this bill proposes to do is really an extension of what the Commission has embarked upon, in both the corporate and the municipal market, and is something that was directly and appropriately mandated in 1975. And the circumstance that more and more individuals are using our debt markets today than ever before in history makes this a particularly timely, appropriate step to take.

Mr. ENGEL. Thank you. The Bond Market Association, it's concerned that the premature release of transaction information might inhibit the trading activity of vital market participants. Could you respond to those concerns and how this might affect the implementation of tools to improve market transparency?

Mr. LEVITT. Well, again, I remember from my own days in the industry, while the industry is enormously progressive, in terms of new products and new ways of funding our capital marketplace, the industry sometimes is reluctant to implement change, in terms of how they deal with the public. I believe that the industry is extremely progressive and the fact that they did such a superb job, in terms of our municipal markets, tells me that they are equally capable of doing the same job, with respect to our corporates. And I understand the reservations that they have, because this is bringing light to a market, which was clearly not as liquid as our equity markets, cannot be treated overnight in the same way that we treat our equity markets.

But the goal is the same. The goal is greater understanding, greater transparency. Congress has appropriately recognized that goal and is mandating the Commission to come up with a solution, which I assure you will be sensitive to the industry, but most sensitive to the public interest. And I think that that sense of balance, between Congress, the private sector, and the public sector is exactly the way to go and the time to go there is now, not 6 months or a year from now.

Mr. ENGEL. I think it was about 5 years ago, NASD introduced a fixed income pricing system to improve transparency in the high yield sector. How well has that worked?

Mr. LEVITT. I think it's worked extremely effectively for what it was meant to do.

Mr. ENGEL. And the SEC's recommendations to NASD, how might that increase the timely dissemination of information?

Mr. LEVITT. I think what we've asked the NASD to do, essentially, is adopt rules, which require dealers to report all transactions in U.S. corporate bonds and preferred stocks to the NASD and to develop a system to redistribute that on a timely basis; and second, to create a data base of transactions, in both corporate bonds and preferred stock; and finally, and I think in some ways most importantly, to create a surveillance program to better detect fraud in this market, something that you simply can't do in the absence of taking the steps that you've asked us to take. And I think they are in the best position to do this. They are already geared up to move forward on this. I believe they have the resources and the experience, and I'm very comfortable having this done by a self-regulatory organization, rather than having government do it.

Mr. ENGEL. Thank you, very much.

Mr. OXLEY. I thank the gentleman. The time has expired. The gentleman from Wisconsin, Mr. Barrett.

Mr. BARRETT. Thank you, Mr. Chairman. I just have a couple of quick questions. Is there anything specifically that you would like to see added to this measure?

Mr. LEVITT. Well, I think working together with the committee, the legislation appears to be thoughtful and sufficiently comprehensive to do the job I think it's intended to do.

Mr. BARRETT. In the ideal world, would there be any tools that you would want to have or do you feel that you have the tools necessary?

Mr. LEVITT. I think with respect to this particular initiative, it gives us the tools necessary to do the job.

Mr. BARRETT. I have no further questions.

Mr. OXLEY. I thank the gentleman. The gentleman from Massachusetts.

Mr. MARKEY. Thank you, Mr. Chairman. Mr. Chairman, you said earlier that there were limitations to the Bond Market Association transparency initiative that necessitate SEC and NASD action. I'd like to explore those limitations further.

First, isn't it true that the scope of the initiative is limited to investment grade debt?

Mr. LEVITT. With respect to the Bond Market Association, yes, that's correct.

Mr. MARKEY. So, all the non-investment grade corporate bonds wouldn't even be covered?

Mr. LEVITT. That's correct.

Mr. MARKEY. Isn't it also true that the industry initiative relies entirely upon voluntary participation?

NASD is a self-regulatory organization under the 34 Securities Exchange Act. It is subject to direct SEC regulation and oversight, to ensure that it meets its obligations under that Act. Because no private organization is subject to the full ray of SEC oversight and review, the NASD is alone in its regulatory protections it provides among those seeking to improve bond market transparency.

In addition to its SRO status, the NASD has developed the NASDAQ Stock Market into the world's premier electronic trading system, with the larger share volume of any market in the world. Its trade data are provided through one of the most extensive private networks in the world, which is being expanded.

As part of that network, the NASD operates the automated confirmation transaction service, or ACT, which handles the post trade process for NASDAQ trade, and in a multi-dealer market similar to the current bond market structure. Among other things, ACT provides mandatory 90 second trade reporting, last sale dissemination, on-line trading comparison and reconciliation, risk management, real time regulatory oversight, and forwarding trades for clearing and settlement. ACT, as we have it today, thus could readily be adapted as a basis for bond reporting and trade comparison system that could provide both heightened oversight and reduced systemic risk.

Since the SEC requested us to undertake this initiative in September of last year, the NASD has conducted extensive research on the depth and breadth of corporate market, reviewed reporting, surveillance elements, met with data vendors, clearing firms, and network display vendors. To pursue the initiative with all deliberate speed, the NASD has empaneled a bond market transparency committee, representing investors in all major segments of the bond market, to ensure that enhanced bond transparency is implemented appropriately and can be provided at the earliest possible time. We are proud of the wide representation that we have been able to obtain on this extremely important committee. Represented on it are individual investors, academia, institutional investors, major U.S. investment banking firms, large discount firms, regional investment banking firms, foreign-based investment banking firms, brokers, brokers, the Bond Market Association, the Securities Industry Association, and our own regulatory fixed income committee.

Our committee has made substantial progress. The committee has agreed, in principle, as to the securities that should be included in the system, which now includes all registered debt securities in 144(a) securities. The committee will determine what will be disseminated and within what timeframe, to ensure maximum transparency, without disrupting markets and, consequently, harming liquidity. The committee has agreed that the NASD's automated confirmation transaction system will be an important tool for the confirmation of reported trades, especially as settlement cycles ultimately shorten the trade date plus one for settlement. The committee has also established that the information that it has collected should be widely disseminated to all vendors, to the maximum extent possible.

The NASD is strongly supportive of the objectives and principles embodied in the Commerce draft of the Bond Price Competition Improvement Act of 1999, and expresses its appreciation, too, Mr. Chairman, for your efforts in this important area. We particularly want to stress the importance of the provision in Section II of that bill, that expressly preserves all of the Commission's authority under Section 11(a). We believe that this provision is especially important in making it clear that the Commission has the authority to approve all the terms on which market information may be obtained and distribute, including the power to ensure that fees charged are fair, reasonable, and non-discriminatory.

The NASD will work, as we have, with the SEC and the securities industry to make the necessary changes at the earliest possible time, with the maximum benefit to the investor and the minimum disruption to the industry. Thank you, Mr. Chairman.

[The prepared statement of J. Patrick Campell follows:]

PREPARED STATEMENT OF J. PATRICK CAMPBELL, CHIEF OPERATING OFFICER, THE NASDAQ STOCK MARKET

I am J. Patrick Campbell, Chief Operating Officer of the Nasdaq Stock Market, Inc.

The NASD would like to thank the Subcommittee for this opportunity to testify again on bond market transparency and the changes needed to improve that transparency for investors and other market participants. It was my pleasure to testify before this Subcommittee last September 29 and share with you our thoughts on bond market transparency. Since that testimony we have made significant progress, which I would like to describe today. I will also accept the Subcommittee's invitation to comment on its draft bill, the Bond Price Competition Improvement Act of 1999.

THE NASD

Let me briefly outline the role of the NASD in the regulation and operation of our securities markets. Established under authority granted by the 1938 Maloney Act Amendments to the Securities Exchange Act of 1934, the NASD is the largest self-regulatory organization for the securities industry in the world. Virtually every broker-dealer in the U.S. that conducts a securities business with the public is required by law to be a member of the NASD. The NASD's membership comprises 5,600 securities firms that operate in excess of 70,000 branch offices and employ more than 590,000 registered securities professionals.

The NASD is the parent company of The Nasdaq Stock Market, Inc, the American Stock Exchange, and NASD Regulation, Inc. (NASDR). These wholly-owned subsidiaries operate under delegated authority from the parent, which retains overall responsibility for ensuring that the organization's statutory and self-regulatory functions and obligations are fulfilled. The NASD is governed by a 27-member Board of Governors, a majority of whom are non-securities industry affiliated. Board members are drawn from leaders of industry, academia, and the public. Among many other responsibilities, the Board, through a series of standing and select committees, monitor trends in the industry and promulgate rules, guidelines, and policies to protect investors and ensure market integrity.

The Nasdaq Stock Market

In keeping with the NASD's mission of facilitating capital formation for the ultimate benefit of investors, the Nasdaq Stock Market develops and operates a variety of market systems and services.

The Nasdaq Stock Market is the largest electronic, screen-based market in the world, capable of handling trading levels of at least one and a half billion shares a day. Founded in 1971, Nasdaq today accounts for more than one-half of all equity shares traded in the nation and is the second largest stock market in the world in terms of the dollar value of trading. It lists the securities of 5,100 domestic and foreign companies, more than all other U.S. stock markets combined.

The American Stock Exchange

As the nation's second largest floor-based exchange, the American Stock Exchange has a significant presence in both listed equities and equity derivative securities. It lists 770 companies, and is widely known for its development of successful new investment products.

NASD Regulation

NASD Regulation is responsible for the registration, education, testing, and examination of member firms and their employees. In addition, it oversees and regulates our members' market-making activities and trading practices in securities, including those that are listed on The Nasdaq Stock Market and those that are not listed on any exchange.

NASDR carries out its mandate from its Washington headquarters and 14 district offices located in major cities throughout the country. Through close cooperation with federal and state authorities and other self-regulators, overlap and duplication is minimized, freeing governmental resources to focus on other areas of securities regulation.

NASDR has examination responsibilities for all of its 5,600 members. In addition to special cause investigations that address customer complaints and terminations of brokers for regulatory reasons, NASDR conducts a comprehensive routine cycle examination program.

THE BOND AND EQUITY MARKETS ARE DIFFERENT

The NASD is well aware of the important differences between the debt and equity markets. These differences include:

- *Size*—The bond markets are many times larger than the equity markets. For example, the combined equity trading on the Nasdaq Stock Market and New York Stock Exchange—the two most active markets in the world, based on dollar volume—totals $44 billion per day. The bond markets' total trading volume is approximately $350 billion per day, or eight times larger.
- *Number of bond issues*—There are many more bond issues than stock issues. For example, about 15,000 stocks trade publicly on US stock markets, but there are more than one million bond issues outstanding.
- *Trading activity*—Bonds trade most heavily in the first weeks after they come to market. After that time, they tend to be placed in portfolios by institutional and various retail accounts and held longer term. Equities tend to trade more frequently and are usually held for a shorter period of time.
- *Yield*—In most areas of the debt market, bonds trade on yield rather than on dollar price and are valued in comparison to benchmark government securities. Bond trading relies on interest rates, inflation expectations, economic data, quality of debt, and the terms of the bond itself, more than on factors that are unique to the issuer.
- *Intermediaries*—Certain sectors of the bond markets rely heavily on the role of the "brokers' brokers." These intermediaries provide anonymity between bond dealers to avoid divulging their dealers' market positions. The brokers' brokers also provide dealers with information to give greater insight into current market situations.
- *Over the counter*—About 90% of all bond trades take place in the over the counter market rather than on an exchange.
- *Transparency*—As discussed below, corporate bond markets trade with less price transparency, that is, the extent to which timely data on prices is visible to all market participants.

Although there are clear differences in the bond and equity markets, the NASD believes that there are principles that apply equally to both, such as the need for price transparency and effective regulation based on modern surveillance systems that examine actual trade data.

THE SEC CALLS FOR TRANSPARENCY

While public perception of the differences between the debt and equity markets has been growing slowly, SEC Chairman Levitt's September 9, 1998 statement brought the problem with the lack of transparency in the bond markets clearly into the public's awareness.

Chairman Levitt identified a clear need for corporate debt market price transparency, saying:

> "Investors have a right to know the prices at which bonds are being bought and sold. This will help them make better decisions, and it will increase confidence in the fairness of the markets. The sad truth is that investors in the corporate bond market do not enjoy the same access to information as a car buyer or a homebuyer or even a fruit buyer. And that's unacceptable. Guesswork can never be a substitute for readily available price data."

Noting that the corporate debt market remains one of the last major US markets to not have some type of electronic price disclosure system, Chairman Levitt announced the NASD's agreement with the SEC to take several actions:

- Propose rules requiring dealers to report all transactions in U.S. corporate bonds and preferred stocks to the NASD and develop systems to receive and redistribute transaction prices on an immediate basis;
- Create a database of transactions in bonds and preferred stocks that will enable regulators to take a proactive role in supervising the corporate debt market, rather than only reacting to complaints brought by investors; and
- Create, in conjunction with the development of a database, a surveillance program to better detect fraud to foster investor confidence in the fairness of these markets.

We are committed to working with the SEC, the Subcommittee, and other parties to develop approaches to bring greater transparency to the bond markets. We believe that transparency is indispensable to market integrity, and we are confident that our efforts will provide greater transparency to the corporate bond market.

NASD BOND TRANSPARENCY BENEFITS

While recognizing the contributions of other organizations, and continuing to work with them for greater transparency, the NASD is uniquely situated to develop the systems and rules for the public dissemination of bond transaction information. These benefits stem from the NASD's SRO status, its proven network and systems capabilities, and its potential to provide comparison and settlement improvements to reduce systemic risk.

SRO Status

The NASD is a Self Regulatory Organization under the 1934 Securities Exchange Act. It is subject to direct SEC regulation and oversight to ensure that it meets its obligations under that Act.

These obligations include: protection of investors and the public interest; promotion of just and equitable principles of trade; fair representation of members; equitable allocation of dues and fees; prevention of fraud and manipulation; fostering cooperation with the clearance and settlement system; facilitation of securities transactions; discipline of members for rule violations; governing the form and content of non-exchange quotations; compliance with SEC requirements on system standards for redundancy, capacity and security; provision of audit trail capability; and maintenance of market surveillance systems.

Because these extensive obligations are neither required of or by any private organization, nor is a non-SRO private organization subject to the full array of SEC oversight and review, the NASD is alone in the regulatory protections it provides among those seeking to improve bond market transparency.

NASD Network and Systems Experience

The NASD has developed the Nasdaq Stock Market into the world's premier electronic trading system, with the largest share volume of any market in the world. Its quotes and trade data are provided through its extensive network to over 300,000 screens worldwide.

The NASD has not rested on its success, however, and is constantly improving its systems. The NASD is now deploying a new, high capacity, high reliability, state-of-the-art enterprise wide communications network to service the more than 7,000 Nasdaq workstations throughout the country. The new network will initially provide us with four billion share day network capacity, expandable to more than double that amount. It uses leading edge communications technology and transparent back-up capability to provide far greater reliability. This new network, one of the world's largest, will ensure that NASD capabilities will be more than adequate to meet any additional capacity required by a bond transparency initiative.

In addition to its market building success and its systems capacity improvements, the NASD operates systems that are relevant to providing additional transparency to the bond markets.

For example, the Automated Confirmation Transaction service (ACT), handles the post-execution process for Nasdaq issues' trades that were negotiated over the telephone or executed in the various execution systems of The Nasdaq Stock Market. Among the critical post-execution steps that ACT handles are: mandatory 90 second trade reporting, last sale dissemination, on-line trade comparison and reconciliation, risk management, forwarding trade data to NASDR Market Regulation for real-time oversight, and forwarding trade data to the National Securities Clearing Corporation for clearing and settlement.

ACT could serve as a basis for a bond reporting and trade comparison system that could provide both heightened oversight and reduced systemic risk. Risk would be reduced by improving the comparison rate for bonds, permitting earlier settlement, simplifying processing, and reducing uncompared trades. In addition, ACT could accommodate the changes needed when the time for settlement is reduced from T+3 to T+1.

NASD PROGRESS TO DATE

Since the SEC requested us to undertake this initiative in September of last year, the NASD has conducted extensive research on the depth and breadth of corporate markets, reviewed reporting and surveillance elements, and met with data vendors, clearing firms, and network display vendors.

The Bond Market Transparency Committee

In order to ensure that enhanced bond transparency is implemented appropriately and can be provided at the earliest possible time, the NASD has empanelled a Bond Market Transparency Committee representing investors and all major segments the bond market. These segments and Committee members include:

- Individual Investors—Dr. John Markese of the American Association for Individual Investors.
- Academia—Dr. Ian Domowitz, Pennsylvania State University
- Institutional Investors—Ian MacKinnon of the Vanguard Group and Edward Wiese of T.Rowe Price Investment Services.
- Large Discount Firms—John Ladensack of Charles Schwab & Company.
- Regional Investment Banking Firms—Stanley Becchetti of A.G. Edwards and Sons, and Michael Shea of J.C. Bradford & Company.
- London-Based Investment Banking Firm—Mark E. Field of Schroder & Company.
- Major Investment Banking Firms—Jane Carlin of Morgan Stanley Dean Witter & Company, Kelly Martin of Merrill Lynch & Company, and Michael Mortara of Goldman, Sachs & Company
- Brokers' Brokers—James Jacoby of Asiel & Company, LLC and Joseph Shea of Cantor Fitzgerald Partners.
- Bond Market Association—William H. James of Lazard Freres & Company.
- Securities Industry Association—Jeffrey Theodorou of Prudential Securities.
- NASDR Fixed Income Committee—Zachary Snow, Chairman of the Fixed Income Committee.

The Committee's Progress

Our Bond Market Transparency Committee has worked diligently from its first meeting on January 14 and is moving quickly to identify and solve the issues involved with increasing transparency. The Committee has made substantial progress.

The Committee has agreed in principle as to the securities that should be included in the system, which now includes: investment grade corporate debt; medium term notes issued by U.S. companies; corporate "Yankees," including development banks, and sovereigns; capital trust securities; convertibles; units; asset-backeds; floating rate notes, and 144A securities.

The Committee will determine what will be disseminated and within what time frame in order to ensure maximum transparency without disrupting markets and consequently harming liquidity.

The Committee has agreed that ACT will be important to the confirmation of reported trades, especially as the settlement cycle shortens to T+1.

The Committee has established that the information that is collected should be widely disseminated to all vendors, to the maximum extent available.

THE BOND PRICE COMPETITION IMPROVEMENT ACT OF 1999

The invitation letter to this hearing asked us to provide our comments on the Committee Draft of the Bond Price Competition Improvement Act of 1999.

The NASD recognizes that the goal of the bill is to ensure that the momentum started by Chairman Levitt and Chairmen Bliley and Oxley last Fall continues toward bond market transparency. The bill would require the SEC to adopt rules on the collection and distribution of transaction information on covered debt securities. In addition, the bill would amend the definition of exempted securities in the 1934 Securities Exchange Act to cover government sponsored enterprises under the bill. Finally, the bill would require studies of inactively traded securities and municipal securities by the GAO, in consultation with the SEC and the Municipal Securities Rulemaking Board.

The NASD is strongly supportive of the objectives and principles embodied in the bill of enhanced bond transparency and remains committed to work with you and your staff as this bill works its way through the legislative process. We particularly want to stress the importance of the provision in Section 2 of the bill that expressly preserves all of the Commission's authority under Section 11A. We believe that this provision is especially important in making it clear that the Commission has the authority to approve all of the terms on which market information may be obtained and distributed, including the power to assure that fees charged are fair, reasonable, and nondiscriminatory.

CONCLUSION

The NASD thanks the Subcommittee for this opportunity to update it on our progress toward increased bond transparency and our views on the recently introduced bill.

We strongly support the goals and objectives of the Committee Draft of the Bond Price Competition Improvement Act, a bill to enhance bond market transparency. We believe that our experience in developing systems for both the equity markets and the high yield bond markets will serve as a strong foundation as we prepare to fulfill our commitment to the SEC to improve transparency in the bond markets. Although we would all like to implement important changes like transparency quickly, we are proud of our efforts to date and pledge our continued efforts. We will work with the Congress, the SEC and the securities industry to make the necessary changes a reality at the earliest possible time, with the maximum benefit to the investor and minimum disruption to the industry.

Mr. OXLEY. Thank you, Mr. Campbell. Mr. Green.

STATEMENT OF MICAH S. GREEN

Mr. GREEN. Thank you, very much, Mr. Chairman. It's a pleasure to be before the subcommittee today. If I could ask that my entire written testimony be submitted for the record and I will talk more topically about the legislation and the Bond Market Association's initiative.

Mr. OXLEY. Without objection, both statements will be made part of the record.

Mr. GREEN. Thank you. Before going into the legislation and our initiative, I want to first commend you and the members of the subcommittee and the leadership of the committee and the staff of the committee for everything they have done since the hearing last September, in urging the industry and the NASD and the SEC to get involved in this effort. Since September, we've taken your guidance and your urging very seriously and we commend you for your leadership in bringing this issue to the level of public attention that it surely needed. And I'd also like to commend the SEC Chairman Levitt, the entire SEC staff and members, as well as the NASD and our friend Pat Campbell for everything they have done in reaching out to the industry, so that we can work cooperatively in this effort. There's not a competition between a private sector initiative and what the NASD is working on. Frankly, they are very complementary efforts. But, we are working very, very closely with the NASD and look forward to that good working relationship going forward on this and other issues. So, I commend them for their leadership.

We represent—the Bond Market Association represents underwriters and dealers of municipal bonds, corporate bonds, government securities, and virtually all bonds that are traded and sold by issuing authorities throughout the country and throughout the world. And we're very proud of the fact and several times over the last many, many years, when this committee has brought to the attention of the industry and the regulators problems that exist in the marketplace, that we have tried to step up to the plate and address those issues. And in so doing, we have tried to be not only responsive to the industry—to the concerns of Members of Congress and the regulators, but have also tried very seriously to look very deeply into ourselves and to make sure we're not missing something. And throughout the consideration of the Government's Securities Act, as well as the municipal securities market and now the corporate market, we've tried to step up and to say what's right and what's wrong about these markets and work vigorously and objectively to try to address those issues.

Our written statement, unfortunately, was submitted prior to the issuance of the final draft of legislation. And I want to state here today that the latest draft that we saw is a draft that the Bond Market Association can be supportive of. We feel very strongly that the legislation reflects the interest of the free marketplace, by acknowledging that private sector initiatives should be considered by regulators prior to finalizing a direction for the regulator to take. And we don't view this as a delay at all, because as you'll hear in a moment, our private sector initiative is weeks away from becoming an absolute reality. But, we do believe that when an industry acknowledges the criticism that is raised by policymakers and is willing to take the actions necessary to address the concerns raised by those policymakers, there should be absolute consideration of the results of that work, because, otherwise, would make all this work meaningless and this work is very important. In a sense, we've become a laboratory for price transparency in the corporate bond market.

So, we commend the subcommittee for including that bracketed language that was talked about earlier. Frankly, I view the brackets more as a highlight, that it's the most important of the bill. And I know that there will be debate on it. But, we do view that if this legislation is not intended to impart new regulatory authority to the SEC, but, in fact, to impart a congressional desire to employ regulatory authority that already exists, what you're doing with this bill is laying out your views, as to how that existing authority should be utilized. And by simply adding that they shall consider—and shall consider the private sector initiatives in carrying out the provisions of this Act, is not an impediment. In fact, it will make the whole process work that much better and the Commission and the regulators and the NASD will have the value of our initiative in moving forward.

Second, the legislation is tremendously improved by including language in there that requires the consideration of the effect on liquidity in the marketplace. We don't sit here today to say that price transparency will hurt liquidity in the marketplace. Rather, we say that liquidity in the marketplace is extremely important; that if you lose liquidity, you hurt the ability of states and corporations and governments to come to market and get the very best prices on their bonds and get the very lowest cost of borrowing. So, it should be a consideration when looking at price transparency in the corporate bond market. And if it proves that it's not a problem, carry on. If it proves that it is a problem, it should influence how the final outcome appears.

And then finally, we are also very appreciative of the fact that your legislation does not spell out a specific form of transparency and you leave that up to what the SROs are doing and what the marketplace is doing, to try to figure out what the best way to approach that issue is. So, we commend you for the current version of legislation and we do look forward to working with you on that.

Now, if I may very briefly talk about where our initiative is and what the derivation of our initiative. The derivation of our initiative is this subcommittee. This subcommittee, and I can hear the words coming out of many of the subcommittee member's mouths, as if it were yesterday, and it was only a few months ago, that the industry had to do something. And we came out of our hearing immediately and met with Arthur Levitt, and after forming a transparency committee, informed him that we were prepared to do something very tangible in this area. And we presented a proposal to him and we sent it, of course, to the committee, as well. And immediately thereafter, we issued a request for proposal, an RFP, from various information providers and information services, to try to implement our price transparency system. We asked that those proposals be delivered by December 31. We really thrilled a lot of people for the Christmas holidays. But by December 31, we received nine proposals from a wide array of information providers.

During the first 2 weeks of January, we reviewed those proposals. And at the end of January, we awarded a contract to GovPX. Why GovPX? Because GovPX is a facilitator of information. Just as it has provided tremendous market-based information in the government securities market, as well as, as Bob Colby said, the agency market, GovPX can be a facilitator here. And to address Congresswoman's Degette's point, they, also, have fabulous quality control measures at work right now in the government securities market, and we wanted them to be employed here, too. And now, we're about to test. Next week we have beta testing planned for this, in the hopes that this system, as designed to try to capture transaction information on a continuous basis through the day on actively traded securities, becomes alive at the end of April.

Now, we're not saying it's the end all and be all. What we're saying is we are doing what we can, as an industry, to facilitate addressing your concerns as a committee as quickly as possible. We are working very closely with the NASD in this whole process, to try to move forward and beyond. But, at this stage, we are a few weeks away of having something up and running that would give everyone, the public, market participants, better information. And it would give regulators the information they need to survey the market, albeit as was said, not for all securities in the market, but for those that we can capture quickly that would give better surveillance and enforcement information and, more importantly, it would give regulators and this committee information as to what price transparency should look like going forward.

So, we believe very strongly that it would be short sighted to move forward on a specific regulatory approach right now, until you've seen the results of this, which is, as you can, by the chart over there are just weeks away. And as soon as it goes on live, we will start seeing information. And also to answer several questions that came out about cost, we intend that this information, on corporate bond transaction information for those actively traded securities would be available through our onsite www.investingandbonds.com, free of charge to investors, just like we do it now for the municipal market. And as Chairman Levitt's written statement said, that municipal market Website is hit many, many times throughout the day.

So, we're very proud of this effort, but we, also, realize that regulators and legislators want more. And we're willing to work toward the next steps beyond this, but we, also, feel very strongly that this laboratory that we've set up will have results from that experiment and they should be allowed to be analyzed and looked at, as we move forward.

So, with that, I welcome your questions. And Mr. Chairman, I thank you and tho committee.

[The prepared statement of Micah S. Green follows:]

PREPARED STATEMENT OF MICAH S. GREEN, EXECUTIVE VICE PRESIDENT, THE BOND MARKET ASSOCIATION

The Bond Market Association appreciates the opportunity to comment on price transparency in the bond markets, and to present our views on associated legislative and regulatory issues. The Bond Market Association represents securities firms and banks that underwrite, trade, and sell debt securities both domestically and internationally. We commend Chairman Bliley, Chairman Oxley, and the subcommittee for taking the time to examine this important issue.

Last September, this Subcommittee held a hearing that examined the state of price transparency in the bond markets. At that hearing, Chairman Bliley and others challenged the industry to improve price transparency in the bond markets. Securities and Exchange Commission Chairman Arthur Levitt made a similar call in a New York speech on September 9th, and again at the hearing. The industry has heeded those calls.

In September, we pledged our support for the goal of providing investors with meaningful price information and reaffirmed our commitment to improve price transparency in the corporate bond markets. In keeping with that pledge, the Association is sponsoring a private-sector initiative that will provide price data on inter-dealer broker trades of investment grade corporate bonds to all market participants and investors. Beginning next month, the Association expects to inaugurate a service that makes transaction price data available directly to regulators and to the public through a wide range of data vendors and free of charge on our investor website. Under a contractual arrangement, the transparency product—Corporate Trades I—is being co-developed by the Association and GovPX Inc. GovPX is a leading provider of price and volume data in the government securities market and will operate the system for data collection and dissemination.

This initiative represents our initial attempt to improve the availability of price data to the public for the corporate bond markets. In addition, the initiative creates a laboratory in which both market participants and regulators can obtain important insights into the interaction between transaction reporting and liquidity. We are pleased to report at this time that the timeframe for the inauguration of public reports by the end of April remains realistic and achievable. At the same time, we acknowledge that this initiative is merely one part of a longer process through which a variety of different systems and solutions will evolve.

Historically, industry-based solutions to transparency challenges in the bond markets have addressed the needs of legislators, regulators, and market participants alike, and have resulted in significant improvements in the amount and quality of price data available to the public *without disruption of market liquidity*. The Bond Market Association played a major, proactive role in the design and implementation of systems to enhance price transparency in the government and municipal bond markets. We will do the same in the corporate markets.

In the government securities market, the Association was instrumental in the creation of the GoxPX system for Treasury securities. Today, GoxPX is recognized as a leading provider of real-time price and volume information, and is widely credited with significantly improving price transparency in the government securities markets. In the municipal market, we worked closely with the Municipal Securities Rulemaking Board (MSRB) to develop a transaction reporting system that provides relevant data to investors. Last November, the Association, in coordination with Standard & Poor's J.J. Kenny, began posting the MSRB's price and volume data—enhanced by yield, credit rating, call dates, and other useful information—on its investor website, *investinginbonds.com*. This user-friendly service enables investors to obtain enhanced end-of-day pricing information—from the previous trading day—on actual municipal bond transactions free of charge.

Clearly, this industry has established a tradition of responding promptly and efficiently to calls for increased price transparency in the bond markets. The corporate markets are no exception. In less than six months, the industry has made substantial progress toward implementing a system that will enhance corporate bond price transparency. [See the attached timeline that illustrates the progress of our transparency initiative.] Our commitment to improving transparency is serious, and we are making it happen. Therefore, we believe it would be premature at this time, to enact legislation designed to immediately mandate transparency through regulatory decree.

In this statement, we focus on three themes. First, we will present our views on the critical relationship between price transparency and market liquidity in the corporate bond markets. Second, we will discuss the progress the industry has made toward improving price transparency since September. Finally, we will discuss why legislation to improve transparency through regulatory decree is not necessary at this time.

Transparency Policy Issues

The Association fully supports the goal of enhancing price transparency in the corporate bond markets. However, price transparency should not be confused with regulatory reporting. Regulatory reporting involves providing trade information to regulators for audit trail or other market surveillance purposes. The Association fully supports the timely transmission of corporate bond transaction information to regulators and/or Self-regulatory Organizations if such reporting is necessary to properly surveil the market to prevent and detect market abuses. However, the appropriate definition of "timely" depends on the regulatory objectives.

The Association encourages regulators to consider the costs and benefits of implementing a system that would require immediate reporting of every trade in the corporate bond markets. The differences between the equity market and the bond markets have long been recognized by regulators. Chairman Levitt himself is on record stating he is "not suggesting that we transpose the national market system built for equities to the debt markets." The Association urges Congress and regulators to keep this in mind as they move forward with plans for enhancing regulatory reporting systems to supplement dealer books and records which have long been available for inspection.

In contrast to regulatory reporting, price transparency is the timely dissemination of trade information to the public. Here, the objective is to provide the public—including both large institutional investors that dominate the corporate bond markets and individuals—with useful information about the current price levels of bonds they hold or wish to buy or sell—without jeopardizing their ability to trade these bonds. Here, we raise the issue of real-time price dissemination because some have indicated their belief that the public has a right to know the prices and volumes of all trades instantaneously.

The nature of the corporate bond markets creates some unique challenges for the design of systems that would efficiently distribute meaningful price data to all investors. First, there are many different bond issues outstanding, and over 95 percent of corporate bonds are held by institutional investors. In the corporate bond markets alone there are an estimated 400,000 individual bonds outstanding.[1] Second, the vast majority of outstanding bonds trade very infrequently, i.e., the bond markets are not continuous trading markets. Unlike the stock market where most issues trade daily, it is not unusual for months to pass between trades in a particular bond issue. For example, in 1996, of the approximately 400,000 corporate bonds outstanding, only 4 percent traded at some point during the year.[2]

The Association is also quite concerned about the negative effect that real-time dissemination could have on liquidity in the corporate bond markets. Since dealers and institutions trade large blocks of bonds, revealing prices and trading volumes instantaneously could hurt market liquidity. If market participants (i.e., potential counterparties) had access to information about other market participant's trading strategies, it would be more difficult to conduct further trades. Given the non-continuous trading environment of the bond markets, a market participant attempting to "unwind" a large position would definitely not want the prices of sales posted before the position was fully liquidated. Often, a small number of institutions or dealers hold very large blocks of a particular issue, and thus, a liquidation of their position would be obvious to the market. Additionally, once the bonds are taken into inventory by a dealer, it could take days, or even weeks to find a buyer for these less-liquid bonds.

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[1] Source: CUSIP Service Bureau. Estimate includes corporate bonds, medium-term notes, asset-backed bonds, and non-agency mortgage securities outstanding as of September 1998.

[2] Bond Market Association estimate.

The bond markets depend on the willingness of dealers to take positions in bonds and carry inventory, thereby shifting market risk to the financial intermediary and creating liquidity for investors. The premature release of transaction information could inhibit the trading activity of these vital market participants. Clearly, a prolonged reduction in market liquidity would have serious consequences not only for the bond markets, but for the economy as a whole. Liquidity disturbances, such as those that occurred in the bond markets last fall, can lead to a higher cost of capital for bond issuers, and inhibit capital formation. Higher capital costs for America's corporations translate into less funding for capital expansion—a significant factor affecting economic growth. This is why the Association's initiative is designed to strike an important balance between transparency and market liquidity.

Regulators have long recognized the differences between highly liquid markets—such as those for most listed equities, and less liquid markets—when crafting rules for various markets with respect to the timeliness and content of public dissemination. In most of the equities markets, price transparency has been equated with real time last sale reporting. While real-time transaction price and size dissemination characterizes the nature of price transparency for liquid equity securities, transparency for illiquid equities is quite different. Trade data for liquid equities must be reported to the NASD within 90 seconds of the transaction via the Automated Confirmation System (ACT), which automatically disseminates trade information to the public. However, trades in illiquid equity securities are reported to the NASD for regulatory purposes—but not via ACT—and these trades are not ever reported to the public. Additionally, odd-lot transactions in National Market securities and private placements (in reliance on Section 4(2) of the Securities Act) are not required to be reported through the ACT system.

Likewise, transparency initiatives for the OTC bond markets need to take into account the individualistic nature of bonds, differences in liquidity, and differences across instruments in the various bond markets. Historically, these differences have been recognized by Congress and regulatory authorities as evidenced by the differences between existing bond market transparency systems that have been developed and have been found to be providing adequate information to date. The attached table illustrates the characteristics of several transaction reporting systems currently operating in U.S. financial markets.

In the government securities market, GovPX is a leading provider of real-time benchmark pricing for all active and off-the-run Treasuries. The liquid nature of Treasury securities led to a solution that provides prompt price dissemination for Treasury securities. In the municipal market, price transparency has been greatly enhanced by the Municipal Securities Rulemaking Board's (MSRB) end-of-day trade reporting, a system that currently includes both dealer and customer trades. Beginning in November 1998, the Association began posting this data on its investinginbonds.com website free of charge. Investors can access CUSIP numbers, security descriptions, number of trades, volume, and high and low prices for municipal bonds that trade four or more times on the prior day. Additionally, investors can sort the data according to State or other criteria. This enhanced user-friendly format has been well-received by the investing public. The less-liquid nature of the municipal securities market led to the development of this time-delayed and synthesized trade reporting system. It is important to note that individual investor response to this data has been extremely favorable and liquidity in this market was apparently unharmed by the implementation of this system.

In the corporate market, a price transparency system for high-yield bonds has been in place since 1994. The NASD introduced the Fixed Income Pricing System (FIPS) to enhance transparency in the high-yield sector. FIPS provides for the collection, processing, and real-time display of firm quotations and summary transaction data for 50 designated (mandatory) high-yield bonds. Interestingly, actual transactions are never disseminated to FIPS participants or to the public. Again, it should be noted that regulators fully recognized the possible harm that could be brought about by real-time transaction dissemination and by imposing a system on the entire market. In a 1991 report to Congress, then SEC Chairman Richard Breeden acknowledged that mandating increased price transparency to the entire high-yield market could be harmful:

> . . . mandating increased transparency for the large segment of the market that is illiquid could further reduce dealer participation in that segment of the market, and is therefore only practical where a "critical mass" of market participants exists.

The foregoing review of transparency systems in the market for illiquid equities and in the bond markets highlights a critical fact. Currently, there are no real-time transaction reporting systems in existence that require or provide immediate public dissemination of every trade in a given class of illiquid securities. Furthermore, regulators have recognized the difference between liquid and illiquid securities when developing regulations for equities and for high-yield bonds. Therefore, the Association would object to any system that mandates dissemination of the price and size of every bond trade to the public on a real-time basis. Given that there is no precedent for requiring such an extensive system, the negative impact on the markets would be difficult to quantify since it has not been observed in any market for relatively illiquid securities. However, academic research has shown that too much transparency can actually increase market volatility and lower market liquidity in markets where trading volume is thin—precisely the type of characterization that applies to a large number of securities in the corporate bond markets.[3] Therefore, the Association is concerned that market liquidity could be negatively affected by the mandatory real-time disclosure of all trades.

The Association believes the best way to expeditiously achieve meaningful price transparency in the corporate bond markets is to embrace a market-oriented approach that is designed to preserve market liquidity. This approach will also allow for the reassessment of existing systems and adjustments to the systems over time. This is consistent with the historical approach to price transparency that has proven to be successful in the government and municipal bond markets.

The Association's Transparency Initiative

The Association has taken the lead in developing a system that will enhance price transparency in the investment grade corporate bond market. In September, the Association organized a Price Transparency Steering Committee, under the auspices of our Corporate Bond Division, to examine the issues that must be considered when designing appropriate systems to improve price transparency without damaging market liquidity. The Committee is comprised of senior bond officials from dealer and inter-dealer broker firms. After the Subcommittee hearing last September, the Committee resolved to implement a system that would respond directly to the challenge put forth by Congress and the SEC.

Members of the Steering Committee met with SEC Chairman Levitt in October to express the industry's desire to design and implement a first-phase transparency solution within a six-month period. Recognizing that the industry initiative would likely have to meld with the longer-term goals envisioned by the SEC, the Steering Committee proceeded with the plan to design an initial price transparency system for investment grade corporate bonds.

In November, the Association issued a "request for proposals" (RFP) that asked pricing and information vendors, as well as others who could facilitate this initiative, to submit proposals presenting how they would implement the Association's initiative by enabling inter-dealer brokers to submit investment grade corporate bond transaction data and redistribute such data to the public through electronic means. The Association also held a bidders conference to answer questions and discuss other aspects of the plan with prospective bidders.

By the end of December, the Association had received nine proposals from an impressive group of bidders. Following interviews and deliberation in January, the Steering Committee selected GovPX as the vendor that would design and operate the system for the industry's transparency initiative. GovPX proposed a collection mechanism that is extremely flexible and can be adapted over time to include a wider range of reporting entities and/or securities. The ability of the initial system to expand and adapt to future modifications is a strong-point of the GovPX system. In addition, from the perspective of the Association, GovPX is essentially a "facilitator" with a strong track record and financial incentives to redistribute price data through the broadest range of existing and prospective data vendors. Finally, GovPX has extensive experience collecting price data from inter-dealer brokers and disseminating that data for the entire range of government securities.

Last month, the Steering Committee adopted a set of initial display parameters for the transparency system, and intends to consider adjustments to these preliminary parameters after the system has become operational. The initial parameters were developed in consultation with a broad range of the Association's membership not only from Wall Street, but from across the country. Of paramount importance to the Committee was the intention to protect the confidentiality of investors' positions, particularly with regard to less-liquid debt securities. Over the past several months, the Committee collected valuable input from inter-dealer brokers, dealers, and their customers before determining the initial parameters for the transparency initiative.

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[3] See Ananth Madhavan, "Security Prices and Market Transparency," Journal of Financial Intermediation, no. 5, 1996, pp. 255-283.

The Association's Voluntary Price Transparency Initiative product, called Corporate Trades I, will collect price data on investment grade corporate bonds from inter-dealer brokers to meet this Subcommittee's priority to disseminate data to the public, and to meet the SEC's and the NASD's priority to obtain information for surveillance purposes. The Association expects that inter-dealer brokers active in the investment grade corporate bond market will report data on all transactions to GovPX. To date, seven leading inter-dealer brokers—which account for approximately 90 percent of investment grade trades of all inter-dealer brokers—have informed the Association of their intent to participate in this voluntary initiative. GovPX will then make the data available to the public consistent with the preliminary display parameters agreed to by the Steering Committee and the Corporate Bond Division of the Association.

With respect to dissemination of transaction data to the public, the initial display parameters will provide for continuous reporting throughout the day of the prices of all investment grade corporate bonds that have been traded at least four times and involve individual transactions of $10 million or less. This information will be disseminated to GovPX subscribers within one hour of the occurrence of the fourth trade and within one hour for all trades in the same security thereafter. At the end of each trading day, the price and size range of every trade meeting these parameters will be disseminated to the public and enhanced with descriptive information including credit ratings and yield-to-Treasury data.

Actual sizes of individual trades will not be revealed publicly in order to preserve investor anonymity, which is important due to the concentrated ownership of corporate bonds. The Association's preliminary view is that these public display parameters strike a fair balance between our objective of enhancing transparency without jeopardizing market liquidity. However, for surveillance purposes, regulators will be provided with a file of *all* price and volume data for all trades reported to GovPX.

We expect this new information product to be available to the public through data vendors before the end of April. In addition, the Association plans to make the data available in a user-friendly format on its investinginbonds.com website free of charge at the same time or shortly thereafter.

Legislation Mandating Regulatory Action is Not Needed

The Association believes that legislation mandating immediate regulatory action for price transparency is unnecessary and unwarranted at this time. This industry has responded promptly to calls for increased transparency. Widespread market abuses have not been identified in the corporate bond markets, nor have investors clamored for more protection due to opaque conditions in the corporate markets. While it is appropriate and commendable for Congress to examine the issues related to price transparency in the bond markets, the industry—given our response and action since last September's hearing—should be given the opportunity to complete development of appropriate, market-specific solutions.

It is our strong belief that, as in the other bond markets, this market-based solution should be assessed before a regulatory response is determined or mandated. In this regard, the Association would be willing to provide Congress with a report that details our progress on implementing the system after it has become operational for a reasonable amount of time. It is our sincere hope that the SEC and NASD, who have already begun a regulatory review of this matter, will take into account the results of this important initiative before decisions are made about a regulatory response. However, if legislation is deemed to be necessary, legislation embodying a logical and orderly market-oriented process would be preferable to legislation that prematurely mandates regulatory action, as the latter would signal regulators to proceed regardless of the results of the industry's initiative.

Some have proposed expanding the National Market System for equities to include the bond markets. In addition, some have advocated expanding the definition of non-exempt securities under Section 11A of the Securities Exchange Act to include federally-sponsorod agency securities and securities issued by international financial organizations, such as the World Bank. The Association opposes such proposals for several reasons.

First, the legislative history surrounding the 1975 Amendments that enacted Section 11A reflects the fact that Congress' intended focus in creating a National Market System (NMS) was on the regulation of the equity markets. The NMS framework and goals were born out of the unique circumstances that characterized the market structure for corporate equity securities in the early 1970s. Bond markets were then, and continue be, significantly different structurally from the equities market.

The SEC and Chairman Levitt have been vocal in their belief that the National Market System should not be transposed on the debt markets. In his speech last September, Chairman Levitt said:

> I am not suggesting that we transpose the National Market System built for equities to the debt markets. For many reasons, that would not work.

Finally, the proposed expansion of the definition of non-exempt securities to include agencies and issues of international financial organizations, is not warranted based on the findings of recent regulatory reports. Last March, the Treasury Department, the SEC, and the Federal Reserve Board released their "Joint Study of the Regulatory System for Government Securities," which considered the state of transparency in the Treasury and agency securities markets. The report recognized the "variety of pricing and related information" that is available from financial publications and online vendors. The report concluded that the government securities market—which by definition includes federally sponsored agencies—is functioning smoothly:

> The market continues to function smoothly, and the three agencies do not believe it is flawed in any fundamental sense. As a result, we believe no additional rulemaking authority under the [Government Securities Act], as amended, is required at this time.

Additionally, the SEC's Debt Market Review came to a similar conclusion regarding Treasury and federal agency securities:

> The combination of real time data for benchmark Treasuries and supplementary quotes and other information for the other securities appears to provide a very good level of pricing information for all government bonds.

The Review also examined non-agency mortgage and other structured products and concluded that the "quality of pricing information and interpretive tools available to the market is good." The SEC has repeatedly decided not to pursue regulatory changes to the markets for agency and non-agency mortgage-and asset-backed securities. The Bond Market Association supports the conclusions of the SEC regarding this matter.

Conclusions

For over a decade, The Bond Market Association has been at the forefront of efforts to improve price transparency in the bond markets. Our most recent initiative will deliver price data on investment grade corporate bonds to the general public on our investor website—free of charge—in the coming weeks. While we agree that enhancing price transparency for liquid securities is a laudable goal, we maintain that widespread dissemination of trade data for illiquid securities will likely have a negative impact on market liquidity and on bond market investors. We will continue to work with the Members of this Subcommittee, the SEC, the NASD, and others, to ensure that investors have access to meaningful price information on bonds. However, we do not believe that legislation mandating immediate regulatory action is warranted at this time. We believe that policy-makers should consider the industry's efforts before determining what regulatory actions may be necessary.

Voluntary Price Transparency Initiative Timeline of Progress

September 1998	October 1998	November 1998	December 1998	January 1999	February 1999	March 1999	April 1999
At transparency hearing, Association pledges to work to enhance price transparency.	Association members meet with SEC Chairman Levitt and begin to develop industry initiative.	Association issues a request for proposals to develop transparency product and hosts bidders.	Association receives proposals from bidding vendors.	Association reviews nine vendor proposals and selects GovPX as vendor for the industry initiative. Association hosts open forum on price transparency.	Association's Transparency Steering Committee adopts parameters for the transparency system—Corporate Trades I.	Association and GovPX plan to begin testing system to transmit and disseminate prices.	Association and GovPX plan to launch Corporate Trades I. Association plans to post data on its investingbonds.com website

Characteristics of Selected Transaction Reporting Systems: Ranked from High to Low Liquidity

Security	System	Security's General Liquidity Type	Reporting	Dissemination Timeframe	Dissemination Audience	Release Actual Trades to Public
Exchange-listed Equities	ACT (Nasdaq) DOT and OARS (NYSE).	Very high	Within 90 seconds of trade (ACT) and automatically in DOT and OARS.	Instantly-price and volume	Market participants and consolidated tape	Yes
Treasury Securities	GovPX	High	Instant-built into system	Instant-price and volume	GovPX participants and subscribing vendors	Yes
Agency Bonds	GovPX	High	Instant-built into system	Instantly-price and volume	GovPX participants and subscribing vendors	Yes
High Yield Bonds-Mandatory Issues[1].	NFIPS (Nasdaq)	Relatively high	Within 5 minutes of trade	Every Hour-Price and Volume Summary	FIPS participants and data vendors	No
Municipal Bonds	MSRB (NSCC)	Varies but typically low	End of day	Next Day price and summary volume data for bonds that traded 4 or more times.	Data vendors and The Bond Market Association's website-investinginbonds.com.	No
Investment Grade Corporate Bonds.	Corporate Trades I (The Bond Market Association/GovPX).	Varies but typically low	Within 15 minutes of trade	Within 1 hour after 4th trade and within 1 hour for subsequent trades—prices released for trades of $10 mil. or less.	GovPX subscribers and investors through Association's website-investinginbonds.com.	No
New York Stock Exchange-Listed Bonds.	ABS (NYSE)	Varies but typically low	Instant-built into system	Instantly-price and volume	market participants and high speed quote line; summary data in newspapers.	Yes[2]
High Yield Bonds-Nonmandatory[3].	FIPS (Nasdaq)	Low	By 5 p.m. on day of trade	None	None	No
Non-Nasdaq Equities[4]	Non-Nasdaq Reporting System (NASD).	Low	Price and volume data reported between 4 p.m. and 6:30 p.m. on trade date or between 7:30 a.m. and 9 a.m. on next business day.	None	No	No

[1] Mandatory FIPS bonds are the 50 most active high-yield bonds as designated by an advisory committee; this committee meets every six months to reassess the mandatory list.

[2] The vast majority of NYSE bond trades are retail, odd-lot transactions.

[3] Non-mandatory FIPS issues are all bonds rated BB+ or lower by Standard & Poor's, excluding those designated as mandatory FIPS issues.

[4] Non-Nasdaq equities are defined as securities that are neither included in The Nasdaq Stock Market nor traded on any national securities exchange.

Mr. OXLEY. I thank both the gentlemen, and we appreciate your good work in this area. Let me begin by asking Mr. Green: what should we be looking for in April, when this program is going to become available? What are you going to be looking for and what do we need to look for, in terms of the applicability of this program and its effectiveness?

Mr. GREEN. Well, in April, and assuming all the beta testing and everything goes well, but so far, so good, transaction information on the investment grade corporate bonds that are traded through interdealer brokers will begin getting reported on a continued—on a continuous basis throughout the trading day to GovPX. GovPX will then pipeline that information out to information vendors, to the Bond Market Association for use on our Website, and also to regulators. And regulators will frankly get complete information, so that they can do their surveillance enforcement activity on those sets of bonds throughout the trading day. Also at the end of the day, there will be more complete reports about the total volumes and buckets of volumes to see what transacted through the trading day. But, immediately when it's turned on, that reporting process will begin.

Now, with regard to our Website, we hope it's—we hope the Website, itself, is ready to take that feed at the end of April and that's—it may be a few weeks after that, once we see the information flowing.

Mr. OXLEY. Let me ask Mr. Campbell, what role then does NASDAQ play in this whole process? Take us through the mechanics of this, if you will. Also, what will you be looking for in terms of the effectiveness of the GovPX program?

Mr. CAMPBELL. Mr. Chairman, we have, since last September, had many meetings with our committee on bond transparency. We have done a fine job in defining and getting in the process of writing rules. We expect to be delivering those rules to the Securities and Exchange Commission very early summer, hopefully in the month of June.

During the period of time that the Bond Market Association's experiment with collecting and disseminating the bond transaction information, we should be very sensitive to what we can learn from them through this initiative and incorporate that into the rules that we write to follow the Securities and Exchange Commission, that all broker-dealers will ultimately have to abide by. And I think the fact that we have included on our committee a representative of the Bond Market Association to assist us in the process, we believe that we should gain some insights that will help us do a better job in the formulation of those rules.

Mr. OXLEY. Let me ask Mr. Campbell, what about junk bonds? First of all, how would junk bonds be in this mix and how would they be treated?

Mr. CAMPBELL. At the current time, we have an existing system that collects information on high yield or junk bonds. We would expect to include that, as has already been determined by the committee, that we would collect and disseminate that information. That is—that decision has already been made. And, in fact, we can continue to use the FIPS system, as Chairman Levitt discussed, to continue to collect that information and dovetail that into the ultimate process.

But at the current time, we have made available in our architecture of the collection system, every vendor out there, who has a terminal out there, including the development and building of a Web-based browser system to those firms, who do not have the technical expertise or the funding to go on a computer interface or subscribe to any of those services, we will allow them to have the input over a Web-based browser system for timely reporting, too. So, we fully expect and have already decided that we will include those securities in the timely reporting, as with the rest of the fixed income securities.

Mr. OXLEY. Thank you. Mr. Green, your plan is basically dealer to dealer? Do you see, at some point, the expansion of dealer to customer arrangement?

Mr. GREEN. Well, within—the voluntary initiative, quite frankly, there's no question, we are not a regulator. We are not a self-regulator. The key element that we're trying to do is to get people, get firms, get market participants to volunteer to do something. And why we picked, you know, interdealer brokers and why we picked corporate—investment great corporate debt, in part, is because the FIPS program already exists. A lot of odd lot retail transactions are already covered by the New York Stock Exchange's ABS system. And we wanted to try to find something that currently wasn't hit by anything with the universe that we could get to volunteer, and to go beyond that voluntarily would probably be more difficult, as an overall industry.

But, I think we need to see what the results of this effort are, and not a long timeframe for results. But, to see how this works, to see how useful the information is, to see the mechanism with which the information is distributed, to see if it's being used by investors, if it's being interpreted correctly, if it's being structured properly, and that will serve as a model for the steps beyond.

Mr. OXLEY. Thank you. My time has expired. The gentleman from New York.

Mr. TOWNS. Thank you, very much, Mr. Chairman. Mr. Campbell, do you support the committee draft?

Mr. CAMPBELL. Yes, sir, we support it.

Mr. TOWNS. Do you think there's anything that's not in there that should be in there?

Mr. CAMPBELL. No, sir. We believe that the committee draft encompasses the intent of the committee and the work that everybody is doing in this area. I think that we would support the draft document and we have—I had the pleasure of participating with this committee and the staff in the assistance and drafting.

Mr. TOWNS. Mr. Green, same question.

Mr. GREEN. The way the legislation is currently drafted, the Bond Market Association can support the current draft.

Mr. TOWNS. What about any additional information that should be put in or anything that's left out that should be in?

Mr. GREEN. Well, we might cross Ts differently or dot Is differently. But with the provisions that I talked about in my testimony, it provides a very balanced approach to ensuring that private sector initiatives and market liquidity are very much a part of the consideration of anything going forward. And for that, we would support it.

Mr. TOWNS. The NASD says that they're uniquely situated to develop a system that moves for the public dissemination of bond transaction information. The Bond Market Association believes that an industry-sponsored solution is the best way to enhance transparency in the bond market. Who is right?

Mr. GREEN. Well, we both are. Because if one——

Mr. SHIMKUS. We're the politicians.

Mr. GREEN. Because if one could address all the needs of policymakers through voluntary industry efforts, one would surely choose to do it that way. But, I think it's incumbent upon industries to self-analyze and recognize that things that can be done, should be done. And then if things need to go further, that's when you may need the next step beyond voluntary, to a level of self-regulation. And if self-regulation doesn't work, you have regulation. And if regulation doesn't work, the Hill will produce legislation that will provide regulators with the means to do it. So, we're at the voluntary stage right now.

Mr. Campbell. In last September's testimony, we weren't given a choice as to whether we wanted to do this or not. We were challenged by this committee and responded very directly to the SEC in their call for increased bond market transparency. We do believe that what we are doing also is a very industry-led solution. We have the largest to the smallest underwriters on the committee; we have firms that represent customers only; we have individuals, who represent specifically the individual investors; as well as the largest purchasers of corporate debt securities in the United States.

So, we do believe that, although my friend and I and our associations differ on very minute, but important issues, that we have continued to make every effort to work together in a collegial fashion, to move this forward for the very best interest of the investor. We continue to gain insights on the committee from the representation of all the associations that really have an interest in this, from the Securities Industry Association, to the Bond Market Association, to the Association of American Investors. We believe that this effort that we're undertaking and have been in the process of is not going to be injurious to the industry. The industry is hard at work in the process to make this the finest resolution, to provide the transparency that they know how to provide. So, they are deeply involved and will continue to work with the Bond Market Association. And between all of us, we will have a product that we can be proud of and the investor will benefit from.

Mr. TOWNS. I think you're saying you can work together? Is that what you're saying?

Mr. CAMPBELL. We plan to go to lunch very shortly here.

We have been to dinner. We have served on the same panels. We're proud of our competitive instincts, but recognize that we have one final goal, and that's to get this to the investor, so the people benefit from increased information.

Mr. TOWNS. Thank you, very much. And maybe you two guys should try breakfast.

Mr. CAMPBELL. We'll try it, thank you.

Mr. TOWNS. I yield back, Mr. Chairman.

Mr. OXLEY. The gentleman's time has expired. The gentleman from Illinois, Mr. Shimkus.

Mr. SHIMKUS. Thank you, Mr. Chairman. I apologize for not being here earlier. I had another subcommittee. You know, I'm very punctual.

But energy power also is a big issue for Illinois and that's my other subcommittee.

This question was asked to a previous panel, but I'd like to address it also to you both. Do you agree that price information is a public good?

Mr. CAMPBELL. Absolutely. We, in the NASDAQ market today, trade over a billion shares a day; have an infrastructure that not only collects and disseminates this information as widely as any other capital market in the world. We have a Website that dispenses this information free to the public that has, in excess, of 20 million hits a day. We spend close to $40 million a year in Web initiatives that are freely accessible to the public. There is nobody that is a strong believer, stronger than NASDAQ, that information and transparency is a positive.

Mr. SHIMKUS. Mr. Green?

Mr. GREEN. I would complement the Website, by the way. I have it book marked and it's really wonderful information. I guess the—I think prices information should be available to the public. There's no question about it. But the price information that the public can get free of charge is either delayed or paid for by someone else. Because, in a sense, market information overall is almost a form of intellectual property. So, where you draw the line between what's intellectual property and when does it become public domain, I think is an argument that lawyers can argue over many lunches, breakfasts, and dinners, and I don't have the answer for that.

But, I think the public policy desire is to get price information to the public. And where it goes from being intellectual property that has a value that cost money, to something that becomes free of charge, is—I don't know where to draw that line.

Mr. SHIMKUS. Is it safe to assume that dealers get a better deal than the public—the consumer?

Mr. CAMPBELL. I think that's probably not true. Today, if I am a public individual and I'm desirous of receiving real, on time, instantaneous quotes, I can presently do that for a maximum amount of only $4 a month, and we have and will have in front of our Board later on this month a proposal to essentially reduce that by half. Most of what happens in those charges are very accessible by any public individual. They can receive it on their PC at home; they can receive it on their pager; and there are many different avenues for them to get that.

Mr. SHIMKUS. Mr. Green?

Mr. GREEN. Well, if Pat's talking about cutting the fees that are paid by members, I have nothing to add.

Mr. SHIMKUS. But, do you agree? I mean, the question really was——

Mr. GREEN. Dealers pay for the data. You know, when instead of going to nasdaq.com, you get the price through a dealer's Website, the dealers pay for that data. So——

Mr. SHIMKUS. There's a pass along charge for just information.

Mr. GREEN. Right. Either direct or——

Mr. SHIMKUS. So, you made the argument, then, that if an individual consumer is buying direct, with the dealer, it's going to be an increased cost?

Mr. GREEN. If the marketplace allows it to be passed along. It's a very competitive marketplace now driving down the cost of transactions and it's not always recoupable.

Mr. SHIMKUS. Let me go to one last question. A lot of information is provided to regulators. Why can't investors get what is given to government bureaucrats?

Mr. CAMPBELL. That's an excellent question. We are in the process of implementing, over the next 12, 18 months, a system called an order audit trail. That is primarily an SEC driven initiative for equity securities. There is no reason why that can't ultimately be transferred to debt securities, whereby very possibly in the next 18 months, 24 months, you can actually go on the Website and find your specific order and be able to track it. And what the public wants more than anything is they want the price that they paid validated. And the way they validate it is to see other transactions along with theirs.

Mr. SHIMKUS. Mr. Green, do you have anything to add?

Mr. GREEN. Yeah, I would just say that we don't want to prejudge whether or not that's doable. But, that's where the issue of considering the effect of liquidity on the marketplace is crucial, because the difference between sending information to a regulator for surveillance and enforcement purposes and disseminating that same very information to the public, in this particular market where you're dealing with large wholesale institutional sized transactions, that can take actually some time to occur and unwind. The premature dissemination of information could affect the pricing of that transaction all along the way.

But, we're not going to prejudge that. We feel that in designing a system that is going to provide for that price transparency, the effect on liquidity should be a consideration, because if it adversely affects liquidity, it will increase risks in that marketplace, and the dealer community puts up the capital to create the markets. But more importantly, the issuing community needs to get the lowest possible cost of capital. When AT&T comes to market later this week for $6 to $8 billion worth of bonds, our quarter-point here or a basis point there makes a lot of difference, and that happens when liquidity is good or liquidity is bad. So, all we're saying, in designing and fashioning a final system, liquidity should be a consideration, as it relates to the public dissemination, to ensure that the mere dissemination doesn't hurt the marketplace that you're trying to help.

Mr. SHIMKUS. Mr. Chairman, my time has expired and I'll yield back.

Mr. OXLEY. I thank the gentleman for participation and we thank you both for a most enlightening testimony. I think we're on the right track and we appreciate all the hard work you've done on your side to make this a reality. Too many times from our perspective we nod in the right direction and say go to it, and don't give you a whole lot of encouragement. In this case, I think, it's a good example of the private sector initiative working very well at our directive, not necessarily in a dictatorial way, but in terms of a cooperative way. I think at the end of the day, that's exactly what's going to happen. It will benefit ultimately the marketplace and the consumer.

So, thank you all for your testimony. And the subcommittee stands adjourn.

[Whereupon, at 12:49 p.m., the subcommittee was adjourned.]

[Additional material submitted for the record follows:]

Liquidity in U.S. Fixed Income Markets: A Comparison of the Bid-Ask Spread in Corporate, Government and Municipal Bond Markets

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Abstract

We examine the determinants of the realized bid-ask spread in the U.S. corporate, municipal and government bond markets for the years 1995 to 1997, based on newly available transactions data. Overall, we find that liquidity is an important determinant of the realized bid-ask spread all three markets. Specifically, in all markets, the realized bid-ask spread decreases in the trading volume. Additionally, risk factors are important in the corporate and municipal markets. In these markets, the bid-ask spread increases in the remaining-time-to-maturity of a bond. The corporate bond spread also increases in credit risk and the age of a bond. The municipal bond spread increases in the after-tax bond yield. Pooling across the three markets, we find that the municipal bond spread is higher than the government bond spread by about 9 cents per $100 par value, but the corporate bond spread is not. Consistent with improved pricing transparency, the bid-ask spread in the corporate and municipal bond markets is lower in 1997 by about 7 to 11 cents per $100 par value, relative to the earlier years. Finally, the ten largest corporate bond dealers earn 15 cents per $100 par value higher than the remaining dealers, after controlling for differences in the characteristics of bonds traded by each group.

1. Introduction

The U.S. bond market is the largest market in the world, with a total current value of over $10 trillion-- up approximately 400 per cent since 1980. While the New York Stock Exchange (NYSE) equity trading amounts to $26 billion per day, trading volume in all bond markets total roughly $350 billion per day (the Securities and Exchange Commission (SEC) press release 98-81). The vast majority of bond markets transactions occur in over-the-counter dealer markets.

An important issue for academics and market participants is the liquidity and transparency of dealer market transactions. Recent finance literature argues that, at least in the equity markets, dealers may not provide competitive pricing of customer trades, compared to auctions markets. For example, Huang and Stoll (1996) find that execution costs are about twice as high on the NASDAQ dealer markets, compared to a matching sample of NYSE stocks. Roell (1992) shows that the execution costs in the London dealer market are higher than in the continental auctions markets.

The inefficiency of dealer pricing is, perhaps, of even greater concern in bond markets than in equity markets. This is because of the lack of price transparency in the former markets since there is no centralized location reporting quotes or trade prices. For inactively traded bonds, different dealers may provide different quotes for the same bond.[2] The SEC has proposed rules to enhance the transparency of the corporate bond market. One measure would require dealers to report all transactions in U.S. corporate bonds and preferred stocks to the NASD and to develop systems to receive and redistribute transaction prices on an immediate basis (SEC press release 98-81).

In the current paper, we estimate the realized bid-ask spreads in the U.S. corporate, municipal and government bond markets for the years 1995 to 1997, based on newly available transactions data for the bond dealer markets. As of 1993, these three bond markets were about two-thirds of the dollar value of the U.S. debt markets (Fabozzi, 1996). We compare the bid-ask spread across the three markets, after controlling for the risk of trading bonds, the level of their trading activity, the transparency of the market and issuer-specific characteristics. As the three markets vary with respect to the control factors, a cross-market comparison is a natural experiment in studying the effects of these factors on market liquidity.

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[2] See Schultz (1998) for a description of the pricing mechanism in corporate bond markets. In September 1998, the House Commerce committee and the Finance and Hazardous Materials subcommittee began holding hearings on whether investors have adequate information about prices when considering investments in the bond market. The title of the hearing: "Improving price competition for mutual funds and bonds."

In terms of credit risk, U.S. Treasury securities are backed by the full faith and credit of the U.S. government, and so are virtually free of credit risk. Corporate bonds may suffer from significant credit risk. For example, in 1992, high risk or junk corporate bonds (rated below Baa by Moody's) were about 23% of volume (Bencivenga, 1995). Municipal bonds have intermediate credit risk due to the financial fragility of some municipals, and the proliferation of innovative bond issues with uncertain legal bondholder rights.[3,4]

In terms of trading activity, U.S. Treasury securities are the second largest sector of the bond market, after the mortgage market. The total volume of debt and size of any single issue is large, compared to the other bond market sectors. For example, as of 1993, there was $2.3 trillion of Treasury debt outstanding from 210 different issues. By comparison, in the corporate and municipal bond markets, there were $1.4 trillion of debt from 10,000 issues and $802 billion of debt from 70,000 separate issuers, respectively (Fabozzi, 1996). The large issue sizes in the U.S. Treasury markets imply that the secondary market is highly liquid, with large trading volumes and narrow bid-ask spreads, as shown in Fleming and Sarkar (1998). Further, the secondary market in U.S. Treasuries is a round-the-clock market, whereas the corporate and municipal bond markets are not—a further indication of the robust trading activity in U.S. Treasuries.

In terms of market transparency, a recent review of the debt markets by the SEC found that the government bond market is highly transparent, that price transparency has improved in the municipal bond market,[5] but is still inadequate in the corporate bond market.

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[3] In addition, since the interest payment on most municipal bonds is exempt from federal income tax, and may be exempt from state and local taxes, investors suffer from tax risk. This is the risk that either the Federal income tax will decrease (lowering the value of tax-exemption) or that a tax-exempt issue may be declared taxable by the Internal Revenue Service.

[4] It should be noted that historically insurance companies have been discouraged from investing in risky bonds. Consistent with this notion, our data set has a small percentage of transactions in the junk bond category.

[5] In 1998, with SEC approval, the Municipal Securities Rulemaking Board expanded its daily reporting. Now, if a municipal security trades at least four times on a given day, then the high, low, and average prices and total par value traded will appear on the MSRB's Combined Daily Report at 6:00 a.m. the next day. The Bond Market Association will make that information available for free on its web site. For the first time, individual investors will now have access to prices and volume information. The web site will also have valuable information about credit ratings, insurance, calls, and yields.

Our first set of results relate to the distribution of the realized bid-ask spread, defined as the difference between the average buy price and the average sell price per bond per day. The spreads are reported on the basis of a $100 par value. We find that the mean spread is the highest in the municipal bond market at 22 cents, followed by the corporate bond market at about 21 cents and the government bond market at 11 cents. The spread is generally higher for bonds with lower Moody's ratings, and lower in 1997 than in the earlier years for all markets. In the corporate and municipal markets, the spread appears to have decreased in each successive year of our sample.

Regarding bond characteristics, municipal bonds have the highest time to maturity, and the lowest trading volume of the three markets. Consistent with market perception that the government bond market is the most liquid sector, government bonds have the lowest age since issuance, and the highest trading volume of the three markets. In all markets, the average time to maturity of bonds is intermediate, between 9 and 11 years, while the average age of bonds varies between 2.75 years and 3.5 years.

Next, we study the determinants of the bid-ask spread separately in the corporate, government and the municipal bond markets. Specifically, using the robust Generalized Method of Moments (GMM) estimation technique, we find that liquidity is an important determinant of the realized bid-ask spread in all three markets. Specifically, in all markets, the realized bid-ask spread decreases in the trading volume. Additionally, risk factors are important in the corporate and municipal markets. In these markets, the bid-ask spread increases in the remaining-time-to-maturity of a bond. The corporate bond spread also increases in credit risk and the age of a bond. The municipal bond spread increases in the after-tax bond yield. Additionally, the bid-ask spread is lower in 1997 compared to the previous two years--by 7 cents for corporate bonds and 10 cents for municipal bonds. However, this is not the case in the government bond market. The result is consistent with the idea that transparency in the corporate and municipal bond markets has improved, perhaps as a consequence of increased regulatory scrutiny.

In each bond market, there are unique factors important for determining the bid-ask spread for that market only. For corporate bonds, the bid-ask spread increases with the age of the bond since issuance. Also, the estimated bid-ask spread for AAA and AA rated corporate bonds are about 21 cents lower than corporate junk bonds (i.e., bonds rated Ba or below by Moody's). For municipal bonds, the bid-ask spread is positively correlated with the annual yield. Since the yield is a before-tax return, we interpret the result to mean that the bid-ask spread is negatively related to the extent of tax subsidy implicit in municipal bond yields.

Is the bid-ask spread different for the three markets, after controlling for its significant determinants? We pool observations from all markets, and estimate a common model. The result shows that the spread in the municipal bond market is higher by 9 cents compared to government bonds, even after the reduction in spreads in 1997, but corporate bond spreads are not. A pair-wise comparison of markets confirms this result. Specifically, the municipal bond spread is higher than the corporate bond spread by 8 cents, but the corporate bond spread is not different from the government bond spread. This result is robust to alternative specifications that take into account the unique determinant of spreads in the government sector.

Following Schultz (1998), we examine whether large dealers charge higher bid-ask spreads compared to smaller dealers. We find that the ten largest dealers charge higher spreads in the corporate and municipal bond markets, but not in the government bond market. The ten largest dealers generally trade different bonds than the other dealers in all three markets. Bonds traded by the ten largest dealers in the corporate and municipal bond markets are significantly riskier (higher duration) and more active (lower bond age) compared to bonds traded by smaller dealers.[6] After controlling for these differences, the spread associated with the ten largest corporate bond dealers is 15 cents more than other dealers, but the municipal bond bid-ask spread is the same for all dealers. We do not find any differences in the bid-ask spread for the trades of the ten largest institutions compared to those of the smaller institutions.

In related work, Schultz (1998) studies the corporate bond market and Hong and Warga (1998) study the corporate and government bond markets using the same data set as ours. Schultz (1998) finds that the bid-ask spread is lower for larger sized trades and for larger institutions, but that it is not affected by relationships between dealers and institutions. Hong and Warga (1998) find no apparent biases in exchange transactions and dealer-market quotes relative to transactions in the dominant dealer market. The authors conclude that effective spreads (calculated by matching quotes with transactions) for the ABS traded corporate bonds are found to be similar to effective spreads for dealer market transactions, although dealer market spreads exhibit substantially higher variability.

The plan for the rest of the paper is as follows. In section 2, we discuss our data and methodology. In section 3, we describe the sample distributions of the bid-ask spread and various bond characteristics. In section 4, we analyze the determinants of the bid-ask spread in the three markets, and compare the spread across them. In section 5, we study whether the bid-ask spread is different for the largest dealers and institutions. Finally, the conclusions are presented in section 6.

2. Data and Methodology

After describing the data in section 2A, we discuss the theoretical determinants of bid-ask spread in bond markets and our empirical proxies in section 2B.

A. Data Description

Our bond transaction data set is comprised of individual bond transactions by insurance companies. From 1995, the National Association of Insurance Commissioners (NAIC)—the regulatory body overseeing the insurance industry—started requiring the insurance companies to report their securities transactions on the Schedule D filings. Accordingly, the insurance companies must provide information pertaining to the total cost of transaction, the number of bond contracts purchased or sold and the date of transaction. We obtain a record of such transactions from Capital Access International (CAI), who, in turn, obtains it from A.M. Best. CAI then cleans the data by verifying the bonds transacted based on available information.

The basic data set used in the paper comprises of daily bond transaction records of insurance companies. The data is available from January 1, 1995 to December 31, 1997. Each record comprises of the transaction date, an eight-digit bond number that identifies the bond, the total dollar value of the transaction, the number of contracts traded and an indication as to whether the order is a buy or a sell order. The original

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[6] It has been suggested to us by practitioners that the largest dealers constitute the primary source of purchasing new issues. By construction, therefore, these dealers deal with relatively younger bonds both in the corporate and in the municipal markets which is what we find.

sample consists of 453,481 individual transactions by insurance companies in the three market sectors: Corporate, Government and Municipal.

CAI provides us additional information about the bonds in our sample, including the credit rating of each bond from Moody's and Standard and Poor's (S&P), the credit sector of issuer (e.g., whether the bond was issued by an industrial company), the issue date. and maturity date. Hong and Warga (1998) and Schultz (1998) obtain similar information by matching the bond transactions from the CAI data with the Fixed Income Database compiled at the University of Houston with data from Lehman Brothers.

To clean the data of potential errors, we delete the following types of observations from the original sample. One, observations on Saturdays and Sundays and those occurring on June 30, 1995, June 30, 1996, and December 31, 1997 are removed. According to our data vendor, insurance companies may have used these dates for recording transactions which they failed to report in a timely manner. This filter removes 42,177 observations from the data set. Two, all transactions where the actual transaction date is reported as an estimate are deleted. This removes 1,652 observations from the sample. Three, we remove observations on bonds that do not have any ratings information.[7] This removes 25,539 observations. Four, we eliminate observations on bond transactions of non-U.S. issuers. This removes 25,268 observations. Finally, we eliminate all observations where the transaction price per $1,000 face value bond is outside the range $500 to $1500.[8] We do this to minimize incidences of data entry error that may adversely affect our analysis. The final filter removes 2,008 observations.

After instituting the above filters, the sample comprises of a total of 290,365 individual transactions in the three market sectors over 1995 -1997, which breaks down into 152,452 individual transactions in corporate bonds, 54,518 individual transactions in government bonds and 83,395 individual transactions in municipal bonds.

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[7] We also eliminate observations on bonds with ratings like MIG-1, MIG-2, P-1, P-2, VMIG-1, or VMIG-2. There are no more than 50 such observations in the original data.

[8] The final filter also removes many trades of 500 bonds or less. This may be important because, during the time period examined, CAI rounded the total transaction cost to the nearest thousand dollars by always rounding up to the next highest one thousand dollars. Prices of smaller sized trades will be most affected by the rounding process. Hong and Warga (1998) delete all observations under 500 contracts, but Schultz (1998) does not, on the ground that the difference between the buy price and the sell price (i.e., the realized spread) is independent of rounding errors.

B. *Discussion of the Empirical Determinants of Bond Market Bid-Ask Spreads*

In the contingent claims model of Merton (1973), the value of corporate debt depends on the risk-free rate, provisions in the bond indenture (such as maturity date, coupon rate, and call provisions) and the probability of default. Based on research in the equity markets,[9] we expect the bid-ask spread to be related to the bond price and, therefore, to the determinants of debt value as indicated in Merton (1973). We control for the default risk in two ways: by creating dummy variables based on Moody's credit ratings; and, for the corporate sector, by the yield spread, defined as the difference between the bond yield and the 91 day Treasury Bill rate. The yield spread is the market's perception of the credit risk of a corporate bond. We do not control for the coupon rate or the risk-free rate in the regressions because these variables are highly correlated with our other explanatory variables.

The bid-ask spread is related to the risk of trading a security since it affects dealers' price risk when adjusting their inventory (Grossman and Miller, 1988). To estimate this effect, we use the term to maturity, or the remaining life of a bond, as a proxy for the bond price volatility. Since market yields change over the life of a bond, the price volatility increases with the term to maturity. The maturity term is obtained by calculating the number of years from a bond's transactions date till the maturity date of a non-callable bond. Callable bonds are omitted from our sample.[10]

The risk of trading a bond is also related to its expected liquidity. Greater liquidity makes it easy to buy and sell bonds at short notice, and reduces the price risk dealers face in making inventory adjustments. We use trading volume as a proxy for liquidity, and distinguish between the dollar buy volume per-bond-per-day and the dollar sell volume per-bond-per-day. The practice of many institutions is to hold bonds to maturity and then reinvest the principal. Hence bond sales may be primarily information driven, causing the bid-ask spread to increase (Kyle (1985), Easley and O'Hara (1987)), whereas purchases may be primarily liquidity driven, causing the bid-ask spread to fall. Research on equity trades of institutions also find an asymmetric effect of purchases and sales on transactions costs (see, for example, Keim and Madhavan (1997) and Madhavan and Smidt (1993)).

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[9] For example, Amihud and Mendelsohn (1986) show that the bid-ask price is a decreasing and convex function of the bid-ask spread.

[10] We also used other measures of bond price volatility, including the Macaulay duration (DURATION), which captures the effect of the change in the price of a bond for a small change in its yield, and convexity (CONVEXITY) to capture the curvature or the convexity of a bond. The three measures, MATURITY, DURATION and CONVEXITY, are highly correlated, and so cannot be used together. We use MATURITY because it the most reliable. DURATION and CONVEXITY may be subject to measurement errors, since we calculate them on the basis of the annual bond yield. The yield is not in our data, and we estimate it using the semi annual coupon payments and the accrued interest payment from the previous coupon interest date.

For the corporate bond market, it is often suggested that a younger bond may be traded more frequently, and has lower spreads resulting from greater liquidity.

In the bond markets, each market sector is divided into categories that reflect common economic characteristics. It is implicitly assumed that each issuer category has a different ability to meet their contractual obligations. For the corporate bond market, we use the dummy variables INDSER, BANKFIN and UTILITES to control for bonds issued by the services and industrial sectors, banking and finance companies, and utilities, respectively. For the municipal bond market, we use the dummy variables HCARE and UTILITIES to control for health care and utility bonds, respectively.

Finally, changes in the market structure may affect the bid-ask spread. In particular, if the market has become more transparent over time, the bid-ask spread may increase or decrease, depending upon which trader group is affected most. Theory generally predicts that uninformed traders prefer greater transparency since they are less likely to be pooled with informed traders, whereas large liquidity traders and informed traders like less transparency (Grossman, 1988; Madhavan, 1995; Pagano and Roell, 1996). Dealers also like less transparency, since it reduces price competition with other dealers (Naik, Neuberger and Viswanathan, 1994). We control for changes in the structure of these markets through the dummy variable 1997, which has the value one if a transaction occurred in 1997 and is zero otherwise.

3. Bid-Ask Spreads, Volatility and Liquidity: Descriptive Statistics

A. Bid-ask Spreads in the Corporate, Government and Municipal Bond Markets

We calculate the realized bid-ask spreads per-bond-per-day as follows. For every bond with at least one buy and one sell transaction in a day, we compute the average buying and selling price per bond per day. The spread per bond per day is the difference between the average selling price per bond from the average buying price for that bond. We have 10,462 observations on the bid-ask spread per bond per day in the three market sectors.[11]

The realized spreads are a noisy estimate of transaction costs, since trades take place at different times during the day. Since our data is not time-stamped within a day, we cannot condition on the transactions time. Additionally, the fact that we need to have at least one buy and one sell of a bond on a given day to calculate the spread dictates that our spread estimates are mainly applicable to relatively active bonds.

Table 1A provides the sample distributions of the bid-ask spread for the three market sectors. All spreads are reported on the basis of a $100 par value. The mean spread is highest for the municipal bond sector at 22 cents, followed by the corporate bond markets at 21 cents, and least for the government bond markets at 11 cents. The mean volume-weighted spread on AAA-rated bonds and junk bonds are 21 cents and 24.33 cents per $100 par value, but the difference is not statistically significant. These numbers are higher than those in Hong and Warga (1998), who report an average volume-weighted spread of 13.28 cents per $100 par value for investment grade corporate bonds, and 19.13 cents for high yield bonds. But, they are lower than the volume-weighted spread of 26.2 cents reported in Schultz (1998).

To check for the robustness of our spread measures, we present, in Table 1B, the corresponding volume-weighted daily dollar spreads. Specifically, the mean volume-weighted dollar spread in the corporate sector is 21.5 cents on a $100 par value basis. Similarly, in the municipal sector, the mean volume-weighted dollar spread is about 22 cents, followed by that in the government sector at about 8 cents. Clearly, these estimates closely resemble the raw spreads reported in Table 1A and, for brevity, we concentrate the remainder of our analysis on the dollar raw spreads alone.

Among the credit sectors, utility sector bonds have higher spreads than the sample average, whereas the industry/services sectors and the banking/financial sectors have lower spreads than the sample average.

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[11] We should stress that the 10,462 daily observations per bond per day across the three market sectors are obtained directly from aggregating across the 290,365 filtered individual observations mentioned at the end of section 2A. This aggregation is necessitated by the fact that the individual transactions are not time-stamped within the trading day which, in turn, precludes a more detailed intra-daily investigation.

Industrial and service sector bonds are about 45 per cent of bonds traded in our sample, with banking/finance company and utility issues being about 32 and 14 per cent of the sample, respectively. By comparison, in 1988, industrials and banking/finance companies accounted for about 46% and 37% of new bond offerings.

In the government bond sector, the median raw and volume-weighted spread per bond per day, on the basis of a $100 par, are 11.1 cents and 8.17 cents, respectively. By comparison, in Hong and Warga (1998), the mean volume-weighted spread for Government/Agency securities is 1.84 cents per $100 par value. Our mean *fractional* volume-weighted spread is 0.1 per cent. For 1993, Fleming and Sarkar (1998) compute fractional volume-weighted spreads for all Treasury securities by maturity. Their estimates range from effectively zero per cent for the 13-week bill to 0.02 per cent for the 30-year Treasury bond. For the 10-year note (closest to the average maturity of our sample), the fractional spread (not reported) is 0.02 per cent.

Finally, for the municipal bond market, the mean raw and volume-weighted spread is 23 cents and 22.93 cents. Among the different credit sectors, spreads are highest for health-care bonds at 23.83 cents and lower than average for utility bonds at 11.43 cents. Our estimate is consistent with available evidence of spreads for institutional investor spreads in the municipal bond market. According to Fabozzi (1996), dealer spreads vary substantially between institutional investors and retail investors. Fabozzi (1996) reports that spreads for institutional investors rarely exceed 50 cents per $100 par value, while those for retail investors vary between 25 cents on large blocks of actively traded stocks to $4 per $100 par value for odd-lot sales of inactive issues.

B. Volatility and Liquidity in the Fixed Income Markets

Table 2 provides the sample distributions of variables that may help predict the level of spreads in the three markets. We find that volatility, as measured by the time-to-maturity, is highest in the municipal bond sector, and about the same in the other two markets.[12] Trading activity, as measured by the dollar buy and sell volumes, is least in the municipal bond market, followed by the corporate and government bond markets, respectively.

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[12] The average Macaulay duration of corporate bonds in our sample is a little more than 6 years, less than the average time-to-maturity, while the average convexity is about 57 years. In the government sector, the average Macaulay duration is a little more than 6 years, and the convexity is about 59 years, comparable to the corporate bond sample. For municipal bonds, both Macaulay duration, at 8.11 years, and convexity, at almost 92 years, are the highest of the three sectors.

The maturity level is intermediate in all three sectors, consistent with the change in business practices of the insurance companies who place increased emphasis on shorter-term-oriented term life and other policies instead of more traditional whole-life policies and investments in long-term bonds. In the Municipal Bond market, the time-to-maturity is 11.29 years, which is at the upper range of the intermediate maturities. In the corporate bond market, the average time to maturity is 9.18 years, similar to the median time to maturity of 8.48 years reported in Schultz (1998).[13] In the Treasury Bond market, the average time-to-maturity is 8.63 years, slightly less than the corporate bond sector.

The average dollar value of a transaction is the largest in the government sector, at about $7.7 million for purchases and about $8.5 million for sales. In comparison, Fleming and Sarkar (1998) report the trade size for the 10-year Treasury bond note as $5.70 million. For the municipal bond market, the average dollar transaction is about $3.4 million for purchases and $3.9 million for sales. In the corporate bond market, the mean dollar trade is about $4.40 million, both for sales and purchases, which is larger than the median trade size of $1.513 million reported in Schultz (1998). The size of insurance company transactions in our sample appears to be fairly representative of the size of the average dealer market transaction. As evidence, the average size of a corporate bond trade on the New York Stock Exchange was $20,000 in 1997, or less than one-half of one per cent of the size of a corporate bond trade in our sample. This is similar to the trade size of *all* transactions on the over-the-counter market, relative to the exchange markets.

The mean age of the bonds is lowest in the Government bond market, at 2.75 years, and about 3.5 years in the other two markets.

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[13] These numbers compare well with those in the Merrill Lynch Taxable Bond Index, Corporate Master, which reports that the average maturity of corporate issues with $10 million or more outstanding has declined continuously from about 20 years in 1978 to 13 years and 7 months in 1988.

4. A Comparison the Bid-Ask Spread in the Corporate, Government and Municipal Bond Markets

A. *Determinants of the Bid-Ask Spread for the Corporate, Government and Municipal Bond Markets using the Generalized Method of Moments (GMM) Estimation*

In the previous section, we saw that the three sectors differ in the level of trading activity and measures of risk, and these differences may account for the differences in the spread. For example, the municipal bond sector has the highest mean spread but also the lowest level of trading volume and the highest volatility. In section 4B, we separately examine the set of factors that determine the bid-ask spread in each market. In section 4C, we directly compare the bid-ask spread in the three sectors, based on our results in section 4B.

Preliminary diagnostics indicated the presence of significant heteroskedasticity in the error term of an equation of the form of (1). Since the functional form of heteroskedasticity in the error terms is unknown, to proceed ahead with an OLS-type estimation with an assumption of the functional form, would in all likelihood leave us with a mis-specified model with its associated problems. To ensure that our results are robust to this possibility, we estimate the price change regression by the more robust Generalized Method of Moments (GMM) technique proposed by Hansen (1982). Note that, unlike the OLS procedure, the GMM technique demands very weak assumptions on the error term -- only that it have well-defined unconditional moments, including when the moments are conditionally varying. Hence we use the GMM technique to estimate the following regression specification:

$$\begin{aligned} Spread_t = {} & Intercept + a_1\, Maturity_t + a_2\, Age_t + a_3\, BVolume_t + a_4\, 1997_t \\ & + Additional\ Dummy\ variables + error_t \qquad (1) \end{aligned}$$

where, for a specific bond on day *t*, the explanatory variables are defined as follows.

Spread$_t$: the daily bid-ask spread for the bond in dollars.

Maturity$_t$: the time-to-maturity for the bond in years. A higher value is likely to increase volatility and, therefore, spreads.

Age$_t$: the time in years between the bond transaction date and its issuance date.

$BVolume_t$: the log of the daily dollar value of purchases for the bond. We do not include both purchases and sales in the same regression, since the two variables are highly correlated. However, in a later specification, we substitute the log of the daily dollar value of sales for *BVolume*.

1997_t: a dummy variable taking the value one if the bond traded in the year 1997, and 0 otherwise. The transaction year dummy is included to control for structural changes in the market. As stated in the introduction, these markets have been under increasing public scrutiny in the past few years and several regulatory changes have been proposed. It may be that these external events have caused changes in dealer behavior, as Christie et al (1994) have documented for the NASDAQ market.

Additional dummy variables: for both the corporate and municipal sectors, we control for credit risk with dummy variables for bonds with Moody's ratings in the categories A1 to A3. For example, the dummy A1 is one for bonds rated A1 by Moody's, and zero otherwise. Also, we define a Utility Sector dummy with value one for bonds issued by Utility companies, and zero otherwise.

For the corporate sector alone, we include additional dummy variables for bonds with Moody's ratings BAA1 to BAA3. We also define the dummy variable AAA & AA, which is one for bonds, rated AAA or AA by Moody's, and zero otherwise. We combine these bonds because we only have 48 AAA rated bonds in the corporate bond sample. The omitted rating category is Junk, those bonds rated Ba or below by Moody's.

For the municipal sector alone, we include a dummy variable for bonds with Moody's rating AA, and another dummy variable Below A3, which is one for bonds rated below A3 by Moody's, and zero otherwise. This category combines bonds rated BAA1 and below since the number of bonds in each of the combined categories was too small. The omitted rating category is AAA, those bonds rated AAA by Moody's.

B. GMM Regression Results for Individual Markets

The second column of Table 3, titled Model 1, shows the results of estimating regression (1) for the corporate bond sector. The adjusted R-square is 2.28 per cent and estimated coefficients of all the nondummy explanatory variables are significant. Two of the estimated dummy coefficients are significant as well. Of the significant estimates, the coefficient on *Maturity* is positive, indicating that the spread increases by 2 cents for every one-year increase in the remaining time to maturity of a bond. The coefficient on *Age* is also positive, indicating that the spread increases by one cent when the bond ages by one more year. An additional $1 million purchase decreases the spread by about 7 cents, consistent with the idea that bond purchases are primarily viewed as liquidity events. Of the credit rating dummies, the coefficient on the combined *AAA/AA* dummy is negative, and indicates that the spread on these bonds is 21 cents lower relative to corporate junk bonds. The remaining credit rating dummies are not significant. Finally, the bid-ask spread for corporate bonds decreased by 7 cents in 1997, relative to the previous two years. The utility sector dummy is not significant.

The second column of Table 4, titled Model 1, shows the results for estimating regression (1) for the government bond sector. The adjusted R-square is essentially zero. While the estimated coefficients have the predicted signs, none are significant. These results indicate that our specification cannot capture the determinants of the realized bid-ask spread in the government sector.

The second column of Table 5, titled Model 1, shows the results for estimating regression (1) for the municipal bond sector. The adjusted R-square is 1.87 per cent. Similar to the corporate bond market, estimated coefficients on the volatility and liquidity variables are significant. The bid-ask spread increases by one cent with every additional year in the *Maturity*, and the spread decreases by 2 cents for an additional $1 million purchase. This further confirms our conjecture that bond purchases are viewed as liquidity events. Similar to the corporate market, the bond spread was lower in 1997 by 11 cents relative to the previous two years. Unlike the corporate sector, the *Age* of the bond is not a significant determinant of the bid-ask spread. Further, none of the credit sector dummies have significant coefficients.

In our second regression specification, we reestimate regression (1) using GMM, but after substituting *SVolume* for *BVolume*, as follows:

$$\begin{aligned} \textit{Spread}_t = {} & \textit{Intercept} + a_1\ \textit{Maturity}_t + a_2\,\textit{Age}_t + a_3\ \textit{Svolume}_t + a_4\,\textit{1997}_t \\ & + \textit{Additional Dummy variables} + \textit{error}_t \end{aligned} \tag{2}$$

where $SVolume_t$ is the log of the daily dollar value of sales of a bond on day t and the additional dummy variables are the same set described earlier for Model 1.

Our conjecture is that the sale of corporate and municipal bonds may be information driven, leading dealers to widen the bid-ask spread. This conjecture is not supported by the results for the corporate and municipal bond sectors, presented in the third column (titled Model 2) of Tables 3 and 5. The coefficient of *SVolume* is negative and not significant in both markets, and its effect in these two markets is to lower the adjusted R-square. However, the sign and significance of the remaining variables are unaffected in both markets. In the government sector, since there is no private information, we interpret *SVolume* as a liquidity variable. The results are in the third column, titled Model 2, of Table 4. Consistent with our interpretation, the coefficient of *SVolume* is negative and significant, and its effect is to increase the adjusted R-square to 1.04 per cent from zero in Model 1.

For the final regression specification, we use unique explanatory variables that may help determine the bid-ask spread for a particular sector. Specifically, for the corporate bond market, we replace the credit rating dummy variables with the *Yield Spread*, as follows:

$$\begin{aligned} Spread_t = {} & Intercept + a1\ Maturiy_t + a2\ Age_t + a3\ Bvolume_t + a41997_t + Yield\ Spread_t \\ & + Utility\ sector\ dummy + error_t \qquad (3a) \end{aligned}$$

where $Yield\ Spread_t$ is defined as the difference between the yield on the bond on day t and the three month Treasury Bill rate on day t. We calculate the corporate yield on the basis of the accrued interest convention used in the market. The *Yield Spread* measures the market's valuation of credit risk, and so we expect the bid-ask spread to increase with it.

The results are in column four (titled Model 3) of Table 3. As expected, the estimated coefficient of *Yield Spread* is positive, but not significant. The adjusted R-square improves slightly relative to Model 1, but the 1997 transaction dummy is no longer significant. The sign and significance of the remaining estimates do no change from Models 1 and 2.

For the municipal bond market, we use the additional explanatory variable *Annual Yield*, as follows:

$$\textit{Spread}_t = \textit{Intercept} + a_1\ \textit{Maturity}_t + a_2\,\textit{Age}_t + a_3\,\textit{Bvolume}_t + a_4\,\textit{1997}_t + \textit{Annual Yield}_t$$
$$+\ \textit{Credit Ratings dummies} + \textit{Utility sector dummy} + \textit{error}_t \qquad \text{(3b)}$$

where *Annual Yield* is just the yield of the bond on day *t*. Since the *Yield* is a before-tax return, we hope to capture tax subsidies embedded in the municipal bonds with this variable. A lower yield implies a higher tax subsidy, which makes the bond more attractive, and so we expect the *Annual Yield* to be positively associated with the bid-ask spread.

The results are in column four (titled Model 3) of Table 5. As predicted, the estimated coefficient of *Annual Yield* is positive and coefficient, indicating that the bid-ask spread decreases by 4 cents for every one per cent decrease in the yield. Estimates that were significant in Models 1 and 2 remain so. The adjusted R-square improves, and the intercept is no longer significant, indicating a better fit for Model 3 compared to the other Models.

For the government bond market, we substitute the *Time To Maturity* variable with the *Term Structure* variable, as follows:

$$\textit{Spread}_t = \textit{Intercept} + a1\ \textit{Term Structure}_t + a2\ \textit{Age}_t + a3\ \textit{Svolume}_t + a4\textit{1997}_t + \textit{error}_t \qquad \text{(3c)}$$

where *Term Structure*$_t$ is defined as the difference between the yield on the government bond on day *t* and the three month Treasury Bill rate on day *t*. The *Term Structure* measures the market's valuation of maturity risk, and so we expect the bid-ask spread to increase with it. The result is reported in column four (titled Model 3) of Table 4. Although the adjusted R-square increases significantly from 1.04 per cent in Model 2 to 3.86 per cent, the estimated coefficient of *Term Structure* is not significant, although it has the right sign.

C. *A Comparison of the Bid-Ask Spread in the Corporate, Government and Municipal Bond Markets -- A Pooled Regression Approach*

In this section, we pool observations across the three market sectors to test whether -- controlling for volatility, credit risk and liquidity -- bid-ask spreads are different in the three sectors. A potential problem with pooling is that it assumes a common set of variables explaining variations in the bid-ask spread in all markets, whereas the results from section 4B indicate some differences in the set of explanatory variables across markets. Our approach is to start with a set of explanatory variables that were found to be significant in all different regression specifications used in the corporate and municipal markets, and later check whether the results are sensitive to different specifications for the government sector. This leads us to use Model 1 as our initial specification.

Accordingly, we estimate (1) with the pooled data. The additional explanatory variables are a dummy for Corporate sector bonds and another dummy for the Municipal sector bonds. The coefficients of these dummies indicate whether corporate and municipal bonds have higher bid-ask spreads than government bonds, after controlling for other factors. To avoid collinearity between these dummies and the intercept, we omit the intercept term. The remaining explanatory variables are the same as before, except for the credit rating dummies. We define a dummy for every rating category except *AAA*. Thus, we start with the *AA* dummy and end with the *Junk* dummy, which includes all ratings categories *Ba* and below.

The results are reported in column two (titled Model 1) of Table 6. The bid-ask spread for municipal sector bonds is higher by 9 cents per $100 par value compared to government bonds, but bid-ask spreads for corporate and government bonds are not statistically different. In addition, the bid-ask spreads in the corporate and municipal bond markets were lower by about 7-11 cents in 1997, compared to the previous two years. Estimates of the time to maturity, the age of the bond, and the *BAA3* dummy are also significant, and have the correct signs.

D. Robustness Checks

From the results in section 4B, Model 1 is a poor fit in the government sector, but a good fit for the Corporate and Municipal bond sectors. So, we repeat the analysis of section *5C*, except that we pool observations from the Corporate and the Municipal markets only. We drop the Corporate sector dummy and retain the Municipal sector dummy. For consistency, we require that the bid-ask spread in the municipal sector should be about 9 cents higher than in the corporate sector. Further, the remaining estimates should be stable in their signs, magnitude and significance.

The results for this exercise are reported in column three (titled Model 2) of Table 6, and they are consistent with our requirements. The bid-ask spread in the municipal bond sector is significantly higher than that in the corporate sector by 8 cents, and the remaining estimates are robust with respect to sign, magnitude and significance.

As a further robustness check, we reestimate (1) for the Corporate and Government bond markets only, but replacing *BVolume* with *TVolume*, the log of the total daily dollar value of transactions. This substitution is meant to account for the fact that, in the individual market regressions, the estimated coefficient of *BVolume* is negative and significant but the estimated coefficient of *SVolume* is not significant for the Corporate bond market; while the opposite is true for the Government bond market. For this specification, we only use the Corporate sector dummy. For consistency, we require that the coefficient on the Corporate sector dummy should not be different from zero. The results, which are reported in column four (titled Model 3) of Table 6, show that this is indeed the case.

As a final robustness check, we estimate the bid-ask spread in the corporate and municipal markets as a seemingly unrelated regression system (SUR). We use the estimates of the SUR regressions as initial values in a system-GMM specification. An advantage of the SUR method is that the bid-ask spread in each market can be explained by the set of explanatory variables best suited for that market, and yet the common information in each market is also accounted for by the contemporaneous correlation between the error terms.[14] Thus, by strategically combining the SUR and GMM techniques, we are able to simultaneously account for both the heteroskedastic error terms as well as the contemporaneous correlation in the error terms across the two markets.

To implement the SUR estimation technique, we need to create a new sample based on a single daily average number for each relevant variable in each market sector. This implies that we consider only those days when there is trading in all relevant markets. In the same spirit, the credit ratings are assigned numerical values to obtain an average credit rating for different bonds trading on the same day. As the regression specification, we use Model 1 from Tables 3 and 5. The results (not reported) are qualitatively similar to those found earlier. Specifically, the bid-ask spread that *cannot* be predicted from the SUR/GMM estimation is higher by about 2 cents for the municipal market, relative to the corporate market.

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[14] Other relevant details of SUR estimation are provided in Greene (1993).

Thus, the extensive robustness tests performed in this section appear to attest to the stability of our regression estimates in the three markets

E. The Factors That Determine Spreads In The Three Market Sectors

In summary, what are the relevant factors determining realized bond spreads in the three market sectors examined in this paper? Liquidity, as measured by *Bvolume/ SVolume* in all three market sectors and also by *Age* in the corporate sector are important determinants of spread. Further, the *Maturity* risk factor appears to be an important determinant of spreads in all three market sectors although its impact on the government sector is relatively indirect compared to the corporate and municipal sectors. Not surprisingly, credit risk is an important determinant of spreads in the corporate and municipal sectors. Finally, the municipal sector has an additional tax factor in *Yield* that significantly determines the spread in this market.

5. The Effect of Large Institutions and Dealers on the Bid-Ask Spread

In this section, we examine the effects of large institutions and large dealers on the realized bid-ask spreads. Keim and Madhavan (1997) document significant differences in equity trading costs across institutions even after adjusting for differences in trading styles. Cao, Choe and Hathaway (1997) and Corwin (1998) document significant heterogeneity among NYSE specialist firms. In a similar vein, the bid-ask spread for large bond dealers and institutions may differ from smaller dealers and institutions.

Table 7 shows the list of the top Institutions within each market sector with a cumulative market share of just over 50% of the average dollar value of trades over the sample period. Panel A presents the top 20 Institutions in the corporate sector, panel B presents the top 17 Institutions in the government sector and panel C presents the top 15 Institutions in the municipal market. In all three panels, the top 4-5 institutions in each market sector account for over 25% of the dollar-value of all trades. The list of large institutions include some money management firms acting as agents of insurance companies. The CAI transactional database reports the institution doing the trading regardless of whether the institution is a bond-portfolio manager or the end user of the bonds.

Table 8 lists the top bond dealers with at least 50% of the market share of the average trading revenues in each of the three market sectors. The total and average dealer revenues are calculated as the difference between dealer sales and dealer purchases. It takes fewer dealers than institutions to account for a 50% market share, which suggests that there may be greater concentration among dealers than among institutions in each of the market sectors.

A. The Bid-Ask Spread for the Ten Largest Dealers and the Others

We calculate the bid-ask spread for the top-10 dealers and those for the remaining dealers in each market sector. For bonds with at least one buy and one sell per dealer (institution) each day, we subtract the average sell price of each bond per day per dealer (institution) from the average buy price of the same bond over the same day by the same dealer (institution). The average bid-ask spread per top-10 dealer (institution) per bond per day is calculated by averaging the bid-ask spread per dealer (institution) per bond per day over all top-10 dealers (institutions). The average bid-ask spread for the non-top-10 dealers (institutions) is similarly calculated.

Panel A of Table 9 presents the bid-ask spread for the ten largest dealers and the remaining dealers in each market sector, identified from the lists in Table 8. We use a Wilcoxon non-parametric test of equality of medians to test whether the bid-ask spread is statistically different between the two dealer groups. In the Corporate sector (panel A), the mean bid-ask spread is 26 cents for the ten largest dealers and 13 cents for the other dealers, and the difference is significant at the 0.01 level. In the Municipal sector, the mean bid-ask spread is 20 cents for the ten largest dealers and 19 cents for the others, a difference also significant at the 0.01 level. In the Government sector, there is no statistical difference between the bid-ask spread of the top-10 dealers and the rest. Finally, the pooled sample mean spread for the ten-largest dealers is about 0.17 cents and is statistically larger than that for the remaining dealers at 0.14 cents.

B. The Bid-Ask Spread for the Ten Largest Institutions and the Others

Panel B of Table 9 presents the bid-ask spread for trades of the top-10 institutions and those of other institutions, in each market sector. The top-10 institutions in each market sector are identified from Table 7. The bid-ask spread is not statistically different (at the 0.10 level) for the ten largest institutions and others in the corporate and government sectors. For example, in the Corporate sector, the mean bid-ask spread is about 14 cents for the top-10 and 15 cents for the non-top-10 institutions. In the Government sector, the mean bid-ask spread is 4 cents for with top-10 institutions and 9 cents for the others. In the municipal sector, the mean bid-ask spread is 25 cents for the top-10 institutions and about 16 cents for the non-top-10 institutions. Finally, the pooled sample mean for the 10 largest institutions is not statistically distinct from that of the remaining institutions at about 0.13 cents.

Although, the numbers for the municipal sector are distinct from the other two market sectors, it should be emphasized that, before drawing any definitive conclusions, a multivariate analysis of the bid-ask spreads, controlling for its various determinants, needs to be performed. We do this in section 5D.

C. Characteristics of Bonds Traded by the Ten Largest Dealers and Others

From panel A of Table 9, we see that the spreads associated with the top-10 dealer transactions are significantly higher that those associated with the non-top-10 dealers. It is likely that this difference could arise from a significantly different (and riskier) universe of bonds traded by the top-10 dealers.

To investigate if the top-10 dealer population does indeed trade a different universe of bonds than does the non-top-10 population, we present in Table 10 a break down of the percentage of common and distinct bonds transacted by each group of dealers within each market sector. Table 10 shows that, in the Corporate sector, only about 8% of the bonds are common to both groups, the ten largest dealers and the others. In the Government and municipal sectors, the per cent of commonly traded bonds are about 30% and 2%, respectively. Thus, the top-10 dealers appear, for the most part, to be dealing in bonds that are distinct from those traded by the rest of the dealers.

To investigate if the top-10 dealer population trade inherently riskier bonds compared to the non-top-

10 dealers, we present, in Table 11, summary statistics of the specific bond characteristics traded by the two groups of dealers for each market sector. In the corporate sector (panel A), bonds traded by the top-10 dealers have higher yields, higher duration, higher convexity, longer time to maturity, lower age and somewhat lower coupon rates.[15] In the government sector, characteristics of bonds traded by the top-10 dealers and the rest do not appear to be different. In the municipal sector (panel C), the annual duration of the top-10 dealer executed bonds is higher, and the bonds are younger. Thus, the evidence suggests that, in the corporate and municipal sectors, the top-10 dealers execute bonds that are riskier but more active (younger) than the non-top-10 dealers. However, the evidence for the municipal bonds is weaker than that for corporate bonds. While riskier bonds would command higher spreads, younger bonds are more liquid and, ceteris paribus, would argue for lower spreads. The resultant higher spreads observed for the top-10 dealer executed bonds would then be the net of the two counteracting forces.

D. Is the Bid-Ask Spread Higher for Large Dealers and Institutions?

In Table 12, we examine whether the transactions of the ten largest dealers are associated with higher spreads, after controlling for differences in the characteristics of bonds traded by the dealer groups. We regress the realized bid-ask spread per bond for each dealer on a dummy variable that equals one if the dealer belongs to the Top 10 group, and is zero otherwise. In addition, we include variables that proxy for the risk and liquidity of the bonds. The regression specifications are the ones earlier found to provide the best explanation of the bid-ask spread in each sector (see Tables 3 to 5). To be specific, they correspond to model one for the corporate and municipal sectors, and model 2 for the government sector.

The results show that the ten largest corporate bond dealers appear to charge 15 cents per $100 par value more than the other dealers, after controlling for bond characteristics. This result does not change when we also control for the other bond characteristics reported in Table 11, such as duration, convexity, the coupon rate and the annual yield. In the other two markets, the differences between the bid-ask spreads of the ten largest dealers and the rest are not significant.

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[15] The observation that the coupon rates of the bonds associated with the top-10 dealer transactions are lower than those associated with the rest of the dealers is consistent with the idea that the largest dealers mostly deal with relatively newer issues and, over much of the nineties, the coupon rates of new issues have been declining (see also footnote 6).

The results for large institutions (not reported) are consistent with the results in Panel B of Table 9. After controlling for bond characteristics, the bid-ask spread is not different for the ten largest institutions compared to the others.

In summary, our multivariate results substantiate the univariate results of section 5C and attest to the robustness of our conclusions.

6. Conclusion

In the current paper, we estimate the liquidity of the U.S. corporate, municipal and government bond markets for the years 1995 to 1997, based on newly available transactions data pertaining to the bond dealer markets. Since these three markets vary with respect to transparency and risk, a cross-market comparison is a natural experiment in studying the effects of these factors on market liquidity.

We find that, on a $100 par value basis, the mean spread is the highest in the municipal bond market at about 22 cents, followed by the corporate bond market at about 21 cents and the government bond market at about 11 cents. The spread is generally higher for bonds with lower Moody's ratings, and lower in 1997 than in the earlier years for all markets. In the corporate and municipal markets, the spread appears to have decreased in each successive year.

We examine the determinants of the realized bid-ask spread using the GMM technique and find that liquidity is an important determinant of the realized bid-ask spread all three markets. Specifically, in all markets, the realized bid-ask spread decreases in the trading volume. Additionally, risk factors are important in the corporate and municipal markets. In these markets, the bid-ask spread increases in the remaining-time-to-maturity of a bond. The corporate bond spread also increases in credit risk and the age of a bond. The municipal bond spread increases in the after-tax bond yield. Additionally, the bid-ask spread is lower in 1997 compared to the previous two years--by 7 cents for corporate bonds and 10 cents for municipal bonds. However, this is not the case in the government bond market. The result is consistent with the idea that transparency in the corporate and municipal bond markets has improved, perhaps as a consequence of increased regulatory scrutiny. Finally, in a pooled regression framework, we find that the municipal bond spread is higher than the government bond spread by about 9 cents per $100 par value, but the corporate bond spread is not.

We also find that the bid-ask spread for the ten largest dealers in our sample is statistically higher than that of other dealers in the corporate and the municipal bond markets. After controlling for differences in characteristics of bonds traded by the large dealers and others, we find that the corporate bond dealers appear to charge 15 cents per $100 par value higher than the other dealers but, in the municipal and government bond markets, the bid-ask spreads are not (statistically) different for the large dealers.

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Table 1A. Distribution of the Raw Bid-Ask Spread (in Dollars) of Corporate, Government and Municipal Bonds, 1995-97.

	CORPORATE SECTOR					GOVERNMENT SECTOR					MUNICIPAL SECTOR				
Panel A															
	Num of distinct bonds	Num of obs	Mean	Median	Std Dev	Num of distinct Bonds	Num of obs	Mean	Median	Std Dev	Num of distinct bonds	Num of obs	Mean	Median	Std Dev
Whole Sample	1779	2499	0.2113	0.0400	1.0003	225	1932	0.1107	0.0452	1.7250	1118	1172	0.2218	0.1003	0.4059
1995	540	625	0.2996	0.1328	1.5059	89	526	0.1296	0.0288	2.2080	307	308	0.3217	0.2161	0.5114
1996	701	1033	0.1882	0.0000	0.8115	72	738	0.1508	0.0418	1.9278	380	391	0.2134	0.1000	0.4152
1997	538	841	0.1739	0.0450	0.6883	64	668	0.0514	0.0503	0.8157	431	473	0.1636	0.0684	0.2938
Panel B															
For Moody's AA Bonds	192	256	0.1071	0.0000	0.8663						384	414	0.2299	0.1269	0.3993
For Moody's A Bonds	749	1069	0.2058	0.0000	0.6390						127	133	0.1817	0.1200	0.3976
For Moody's Junk Bonds	280	374	0.2314	0.1093	1.5392										
Panel C															
Industrial/Service	798	1169	0.2051	0.0685	1.0100										
Banking/Finance	562	775	0.1728	0.0000	0.6088										
Utility	252	330	0.2622	0.1000	1.0100						222	236	0.2127	0.1259	0.2923
Health Care											21	24	0.3923	0.0978	0.6565

Note:

- All spreads across the market sectors are statistically distinct at the 0.01 level (from Wilcoxon non-parametric tests).
- Spreads in panel B are not statistically different from one another at the 0.10 level (from Wilcoxon non-parametric tests).

Table 1B. Distribution of the Volume-weighted Raw Bid-Ask Spread (in Dollars) of Corporate, Government and Municipal Bonds, 1995-97.

	CORPORATE SECTOR					GOVERNMENT SECTOR					MUNICIPAL SECTOR				
Panel A															
	Num of distinct bonds	Num of obs	Mean	Median	Std Dev	Num of distinct Bonds	Num of obs	Mean	Median	Std Dev	Num of distinct bonds	Num of obs	Mean	Median	Std Dev
Whole Sample	1779	2499	0.2150	0.0400	0.8967	225	1922	0.0813	0.0389	1.7953	1118	1172	0.2209	0.1000	0.4031
1995	540	625	0.2997	0.1328	1.4877	89	529	0.0844	0.0226	2.2345	307	308	0.3191	0.2149	0.5033
1996	701	1033	0.1986	0.0000	0.6211	72	738	0.1241	0.0381	2.0732	380	391	0.2137	0.1000	0.4161
1997	538	841	0.1724	0.0461	0.6886	64	668	0.0315	0.0484	0.8041	431	473	0.1629	0.0684	0.2925
							Panel B								
For Moody's AA Bonds	192	256	0.1249	0.0000	0.8083						384	414	0.2291	0.1283	0.3984
For Moody's A Bonds	749	1069	0.2065	0.0000	0.6506						127	133	0.1813	0.1200	0.3972
For Moody's Junk Bonds	280	374	0.2433	0.1154	1.5452										
							Panel C								
Industrial/Service	796	1169	0.2078	0.0800	1.0086										
Banking/Finance	562	775	0.1769	0.0000	0.5894										
Utility	252	330	0.2563	0.1000	1.0159						21	24	0.3904	0.0982	0.6455
Health Care											222	236	0.2110	0.1228	0.2928

Note:

- All spreads across the market sectors are statistically distinct at the 0.01 level (from Wilcoxon non-parametric tests).
- Spreads in panel B are not statistically different from one another at the 0.10 level (from Wilcoxon non-parametric tests).

Table 2. Distribution of Bond Characteristics in the Corporate, Government and Municipal Sectors, 1995-1997.

Panel A: Corporate Bonds

VARIABLE	Num. Distinct Bonds	Num. obs	MEAN	STD	MAX	Q3	MED	Q1	MIN
Annual yield	1776	2499	0.0735	0.0136	0.2332	0.0778	0.0710	0.0668	-0.0315
Duration	1776	2466	6.1239	2.5824	20.5000	7.1823	5.7684	4.2878	1.4430
Convexity	1776	2466	57.0012	57.9899	417.6770	61.7884	38.1697	20.9619	2.6339
Time to maturity	1792	2486	9.1777	7.4128	99.3425	9.7589	7.1164	4.8356	1.1880
Bond age	1792	2437	3.5765	4.6010	67.7753	4.3973	2.8630	1.5014	-0.6247
Coupon rate	1792	2477	0.0777	0.0148	0.1400	0.0875	0.0763	0.0675	0.0000
Average price	1805	2499	1022.28	72.45	1473.67	1058.25	1011.00	980.91	500.00
Dollar Buy volume	1805	2499	4.4229	7.6329	159.4490	5.3230	2.1160	0.9670	0.0000
Dollar sell volume	1805	2499	4.4457	5.4586	46.5220	5.3030	2.3580	1.0050	0.0010

Panel B: Government Bonds

VARIABLE	Num. Distinct Bonds	Num. obs	MEAN	STD	MAX	Q3	MED	Q1	MIN
Annual yield	209	1886	0.0635	0.0061	0.1141	0.0666	0.0629	0.0595	0.0475
Duration	209	1885	6.0749	2.9393	14.0636	7.1264	5.7506	3.9997	0.9780
Convexity	209	1885	58.7678	68.6032	289.7408	60.4080	37.6792	18.1126	1.3734
Time to maturity	222	1923	8.6256	7.2009	30.1083	9.2137	6.5562	4.3068	0.8356
Bond age	222	1666	2.7498	2.6225	20.9644	3.7507	2.2685	0.8658	-0.0164
Coupon rate	222	1893	0.0667	0.0096	0.1338	0.0725	0.0650	0.0600	0.0470
Average price	226	1932	1019.48	65.46	1417.40	1037.97	1008.78	983.00	509.34
Dollar buy volume	226	1932	7.7370	22.3724	365.7170	5.4015	1.6135	0.4830	0.0010
Dollar sell volume	226	1932	8.4548	23.5339	354.3880	6.6950	2.0780	0.7215	0.0010

Panel C: Municipal Bonds

VARIABLE	Num. Distinct Bonds	Num. obs	MEAN	STD	MAX	Q3	MED	Q1	MIN
Annual yield	1170	1229	0.0544	0.0086	0.1521	0.0568	0.0532	0.0500	0.0391
Duration	1170	1229	8.0922	2.7928	15.1074	10.1596	8.3730	5.9035	1.4620
Convexity	1170	1229	90.5676	60.9117	333.1750	126.4541	82.7718	39.5389	2.7888
Time to maturity	1170	1229	11.1836	5.5722	32.2877	14.4370	10.8000	6.7247	1.1918
Bond age	1170	1229	3.5109	3.6658	35.8247	4.0849	2.8685	1.6603	0.0137
Coupon rate	1170	1229	0.0577	0.0093	0.1263	0.0620	0.0565	0.0515	0.0313
Average price	1170	1229	1022.81	58.30	1386.64	1057.37	1020.09	994.21	840.08
Dollar Buy Volume	1170	1229	3.0384	3.4637	38.5240	4.3535	1.9505	1.0015	0.0200
Dollar sell volume	1170	1229	3.4732	3.9299	38.4880	4.9250	2.1245	1.0266	0.0030

Table 3. Determinants of the Bid-Ask Spread for Corporate Bond Transactions, 1995-1997.

The dependent variable is the bid-ask spread per bond per day denominated in dollars per $100 par value. The estimates and standard errors for parameter significance are obtained from a Generalized Method of Moments (GMM) regression. The p-values of parameter significance are in parentheses under the respective estimates. All coefficient estimates significant at the 0.10 level or higher are indicated in bold

Independent Variables	Model 1	Model 2	Model 3
	Estimated Coefficients (Two tailed p-value)	Estimated Coefficients (Two tailed p-value)	Estimated Coefficients (Two tailed p-value)
Intercept	**0.6** **(0.0006)**	0.09 (0.64)	**0.41** **(0.0153)**
Time to maturity (years)	**0.02** **(0.0001)**	**0.02** **(0.0001)**	**0.02** **(0.0001)**
Bond age (years)	**0.01** **(0.0287)**	**0.01** **(0.0132)**	**0.01** **(0.0922)**
Log of Buy Volume	**-0.07** **(0.0003)**	—	**-0.06** **(0.0018)**
Log of Sell Volume	—	-0.002 (0.9)	—
Yield Spread	—	—	0.05 (0.17)
Moody's AAA & AA dummy	**-0.21** **(0.0369)**	**-0.18** **(0.08)**	—
Moody's A1 dummy	-0.07 (0.4369)	-0.05 (0.62)	—
Moody's A3 dummy	-0.07 (0.44)	-0.07 (0.46)	—
Moody's A3 dummy	-0.08 (0.15)	-0.09 (0.33)	—
Moody's BAA1 dummy	-0.02 (0.79)	-0.04 (0.67)	—
Moody's BAA2 dummy	-0.1 (0.32)	-0.12 (0.23)	—
Moody's Baa3 dummy	0.07 (0.65)	0.06 (0.7)	—
Utility Sector Dummy	0.03 (0.67)	0.01 (0.84)	0.04 (0.56)
1997 Transaction Dummy	**-0.07** **(0.003)**	**-0.05** **(0.19)**	-0.06 (0.1012)
Number of observations	2390	2390	2380
Adjusted R square (per cent)	2.28	1.54	2.38

Table 4. Determinants of the Bid-Ask Spread for Government Bond Transactions, 1995-1997.

The dependent variable is the bid-ask spread per bond per day denominated in dollars per $100 par value. The estimates and standard errors for parameter significance are obtained from a Generalized Method of Moments (GMM) regression. The p-values of parameter significance are in parentheses under the respective estimates. All coefficient estimates significant at the 0.10 level or higher are indicated in bold.

Independent Variables	**Model 1** **Estimated Coefficients (Two tailed p-value)**	**Model 2** **Estimated Coefficients (Two tailed p-value)**	**Model 3** **Estimated Coefficients (Two tailed p-value)**
Intercept	0.14 (0.54)	0.91 (0.0031)	0.42 (0.18)
Time to maturity (years)	0.01 (0.52)	0.01 (0.37)	—
Bond age (years)	0.01 (0.65)	-0.002 (0.95)	-0.03 (0.41)
Log of Buy Volume	-0.01 (0.62)	—	—
Log of Sell Volume	—	**-0.11** **(0.0125)**	**-0.11** **(0.009)**
Term Structure	—	—	0.63 (0.15)
1997 Transaction Dummy	-0.10 (0.18)	-0.10 (0.17)	-0.15 (0.12)
Number of observations	1666	1666	1642
Adjusted R-square (per cent)	-0.04	1.04	3.86

Table 5. Determinants of the Bid-Ask Spread for Municipal Bond Transactions, 1995-1997.

The dependent variable is the bid-ask spread per bond per day denominated in dollars per $100 par value. The estimates and standard errors for parameter significance are obtained from a Generalized Method of Moments (GMM) regression. The p-values of parameter significance are in parentheses under the respective estimates. All coefficient estimates significant at the 0.10 level or higher are indicated in bold.

Independent Variables	**Model 1**	**Model 2**	**Model 3**
	Estimated Coefficients (Two tailed p-value)	**Estimated Coefficients (Two tailed p-value)**	**Estimated Coefficients (Two tailed p-value)**
Intercept	**0.36** **(0.0001)**	**0.22** **(0.0028)**	0.18 (0.13)
Time to maturity (years)	**0.01** **(0.0132)**	**0.01** **(0.0375)**	**0.005** **(0.0934)**
Bond age (years)	-0.003 (0.31)	-0.002 (0.50)	-0.004 (0.22)
Log of Buy Volume	**-0.02** **(0.0087)**	—	**-0.02** **(0.08)**
Log of Sell Volume	—	-0.0003 (0.98)	—
Annual Yield	—	—	**0.04** **(0.04)**
Moody's AA dummy	0.003 (0.91)	$-0.3*10^{-4}$ (0.99)	0.01 (0.73)
Moody's A1 dummy	-0.07 (0.16)	-0.07 (0.14)	-0.07 (0.16)
Moody's A2 dummy	0.01 (0.91)	0.005 (0.95)	$3*10^{-4}$ (0.9957)
Moody's A3 dummy	-0.01 (0.92)	-0.01 (0.85)	-0.03 (0.65)
Below Moody's A3 dummy	0.06 (0.79)	0.06 (0.41)	0.03 (0.65)
Utility Sector Dummy	-0.03 (0.27)	-0.03 (0.23)	-0.03 (0.33)
1997 Transaction Dummy	**-0.11** **(0.0001)**	**-0.11** **(0.0001)**	**-0.10** **(0.0001)**
Number of observations	1171	1171	1170
Adjusted R-square (per cent)	1.87	1.56	2.34

Table 6. Comparison of the Bid-Ask Spread for Corporate, Government and Municipal Bond Transactions, 1995-1997.

The dependent variable is the spread per bond per day denominated in dollars per $100 par value. Model 1 includes transactions from Corporate, Government and Municipal bond markets. Model 2 includes transactions from the Corporate and Municipal Markets only. Model 3 includes transactions from the Corporate and Government Markets only. The estimates and standard errors for estimating parameter significance are obtained from a Generalized Method of Moments (GMM) regression. The p-values of parameter significance are in parentheses under the respective estimates. All coefficient estimates significant at the 0.10 level or higher are indicated in bold.

Independent Variables	**Model 1**	**Model 2**	**Model 3**
	Corporate, Government and Municipal Markets	Corporate and Municipal Markets	Corporate and Government Markets
Time to maturity (years)	**0.01** **(0.0019)**	**0.02** **(0.0001)**	**0.02** **(0.0001)**
Bond age (years)	**0.01** **(0.0179)**	**0.01** **(0.0004)**	**0.01** **(0.0237)**
Log of Buy Volume	-0.003 (0.52)	-0.01 (0.15)	---
Log of Total Volume	---	---	-0.02 (0.25)
Municipal Sector dummy	**0.09** **(0.1)**	**0.08** **(0.0306)**	---
Corporate Sector dummy	0.06 (0.35)	---	0.21 (0.35)
Moody's AA dummy	-0.03 (0.25)	-0.01 (0.67)	-0.11 (0.42)
Moody's A1 dummy	0.03 (0.57)	0.07 (0.12)	0.04 (0.75)
Moody's A2 dummy	0.02 (0.63)	0.07 (0.13)	0.03 (0.84)
Moody's A3 dummy	0.02 (0.77)	**0.09** **(0.09)**	0.01 (0.97)
Moody's BAA1 dummy	0.06 (0.21)	**0.14** **(0.0046)**	0.06 (0.65)
Moody's BAA2 dummy	-0.01 (0.9)	0.07 (0.34)	-0.02 (0.86)
Moody's Baa3 dummy	**0.25** **(0.0479)**	**0.5** **(0.0001)**	0.15 (0.41)
Moody's Below Baa3 (Junk) dummy	0.1 (0.3)	0.15 (0.11)	0.09 (0.55)
Utility Sector Dummy	-0.01 (0.78)	-0.05 (0.21)	0.02 (0.77)
1997 Transaction Dummy	**-0.07** **(0.0106)**	**-0.08** **(0.0019)**	-0.06 (0.16)
Number of observations	5273	3570	2399
Adjusted R-square	0.0052	0.0083	0.0158

Table 7. Institutions With at least 50% Share in the Corporate, Municipal and Government Bond Markets, 1995-1997.

The revenues per Institution are calculated as the dollar value of the sells minus the dollar value of purchases over the sample period. The average revenue per transaction is simply the total dollar value divided by the number of transactions by the same institution over the sample period.

Panel A: Corporate Bond

Institutions	Rank	Number of trades	Number of sells	Mean Trade Value ($ 000's)	Total Trade Value ($ Billions)	Percent Of Trades	Cumulative Percent Of Trades	Total Revenue ($ Billions)	Average Revenue per Transaction $
Prudential Capital Management Group	1	4483	1527	6939.843	31.111	6.593	6.593	-13.742	-3065.37
Metropolitan Life Insurance Company (Investments)	2	2868	1041	9440.052	27.074	5.737	12.330	-9.526	-3321.39
The Travelers Investment Management Group	3	3190	1126	5681.945	18.125	3.841	16.171	-4.788	-1500.88
American General Corporation	4	4571	1967	3837.325	17.540	3.717	19.888	-4.149	-907.60
New York Life Insurance Company	5	1870	804	9379.765	17.540	3.717	23.605	-3.957	-2115.97
Conseco Capital Management	6	5736	2495	2332.558	13.380	2.835	26.440	-2.038	-355.22
Aeltus Investment Management	7	1462	504	8382.967	12.256	2.597	29.037	-3.942	-2696.41
Northwestern Mutual Life Insurance	8	1660	645	6728.141	11.169	2.367	31.404	-3.374	-2032.37
Hartford Investment Management Company (HIMCO)	9	2124	746	5206.334	11.058	2.343	33.748	-3.484	-1640.27
Alliance Capital Management L.P.	10	1441	565	6938.254	9.998	2.119	35.866	-2.817	-1955.12
Transamerica Investment Services I	11	1602	522	5837.174	9.351	1.982	37.848	-3.608	-2251.94
AEGON U.S.A. Investment Management	12	2554	1041	3268.584	8.348	1.769	39.617	-0.627	-245.57
GNA Capital Management	13	1556	460	4932.760	7.675	1.626	41.243	-3.096	-1989.82
Lincoln Investment Management	14	2246	878	3221.875	7.236	1.533	42.777	-1.339	-596.20
Allstate Insurance Company	15	1271	369	5560.609	7.068	1.498	44.275	-3.192	-2511.20
Loews Corporation	16	1186	559	5917.658	7.018	1.487	45.762	-1.539	-1297.98
Provident Life & Accident Insurance	17	1057	446	5760.658	6.089	1.290	47.052	-1.230	-1163.72
CIGNA Investments	18	1786	664	3307.946	5.908	1.252	48.304	-1.611	-901.92
State Farm Insurance Companies	19	609	34	9434.007	5.745	1.217	49.522	-5.089	-8357.12
Zurich Investment Management	20	1431	696	3879.611	5.552	1.176	50.698	-0.615	-429.87
Total		44703	17089		239.243				

Table 7 continued

Panel B: Government Bond

Institutions	Rank	Number of trades	Number of sells	Mean Trade Value ($ 000's)	Total Trade Value ($ Billions)	Percent Of Trades	Cumulative Percent Of Trades	Total Revenue ($ Billions)	Average Revenue per Transaction $
Northwestern Mutual Life Insurance	1	698	347	36118.506	25.211	11.276	11.276	-0.318	-455.43
Loews Corporation	2	564	281	30554.606	17.233	7.708	18.984	-5.527	-9800.50
Zurich Investment Management	3	1119	553	8225.391	9.204	4.117	23.100	-2.862	-2557.21
Prudential Capital Management Group	4	521	268	15942.946	8.306	3.715	26.815	-1.507	-2892.37
The Travelers Investment Management Group	5	852	384	9487.086	8.083	3.615	30.431	0.613	719.39
Metropolitan Life Insurance Company (Investments)	6	520	261	15164.540	7.886	3.527	33.958	-1.079	-2074.12
New York Life Insurance Company	7	323	157	16848.053	5.442	2.434	36.392	-0.378	-1171.16
Allianz Investment Corporation	8	416	166	9978.678	4.151	1.857	38.248	-1.275	-3065.17
Massachusetts Mutual Life Insurance	9	203	72	19135.847	3.885	1.737	39.986	-1.611	-7936.17
Hartford Investment Management Company (HIMCO)	10	448	182	8426.243	3.775	1.688	41.674	-1.371	-3059.52
Aeltus Investment Management	11	341	151	10902.472	3.718	1.663	43.337	-0.536	-1572.81
Scudder Kemper Investments (Boston)	12	995	370	3477.354	3.460	1.548	44.884	-1.041	-1045.75
AIG Global Investment Corp.	13	593	304	4931.875	2.925	1.308	46.193	0.151	254.68
Allstate Insurance Company	14	217	82	12683.180	2.752	1.231	47.423	-0.624	-2874.43
Nationwide Insurance Companies	15	243	64	10401.370	2.528	1.130	48.554	-1.018	-4190.10
CIGNA Investments	16	489	189	4997.534	2.444	1.093	49.647	-0.680	-1391.43
Manulife Financial	17	257	129	8725.735	2.243	1.003	50.650	-0.286	-1111.69
Total		8799	3960		113.244				

Panel C: Municipal Bond

Institutions	Rank	Number of trades	Number of sells	Mean Trade Value ($ 000's)	Total Trade Value ($ Billions)	Percent Of Trades	Cumulative Percent Of Trades	Total Revenue ($ Billions)	Average Revenue per Transaction $
Loews Corporation	1	1266	665	7575.647	9.591	5.935	5.935	-1.564	-1235.04
Allstate Insurance Company	2	1613	526	5769.999	9.307	5.759	11.694	-4.124	-2556.77
State Farm Insurance Companies	3	3032	1	2667.245	8.087	5.004	16.698	-8.084	-2666.33
AIG Global Investment Corp.	4	1701	216	4566.777	7.768	4.607	21.505	-6.413	-3769.88
Scudder Kemper Investments, Inc. (Boston)	5	3401	1267	2105.060	7.159	4.430	25.936	-2.024	-594.99
Hartford Investment Management Company (HIMCO)	6	1511	154	4112.828	6.214	3.846	29.781	-4.941	-3269.98
Employers Reinsurance Corporation	7	3069	1070	1832.609	5.624	3.460	33.261	-1.087	-354.12
General Reinsurance Corporation	8	1312	375	4055.886	5.321	3.293	36.554	-2.756	-2100.86
The Travelers Investment Management Group	9	1111	360	4275.799	4.750	2.940	39.494	-2.171	-1954.47
Allmerica Asset Management, Inc.	10	1073	340	3332.609	3.576	2.213	41.707	-0.952	-887.00
Guardian Life Insurance Co. of America	11	516	255	6424.506	3.315	2.051	43.758	0.036	89.09
The Chubb Corporation	12	867	138	3674.307	3.186	1.971	45.729	-2.470	-2848.86
General Electric Investment Corporation	13	1013	497	2720.936	2.756	1.706	47.435	-0.290	-286.44
Ambac Capital Management, Inc.	14	652	246	3961.571	2.583	1.598	49.033	-0.779	-1195.47
SAFECO Asset Management Company	15	680	222	3518.868	2.393	1.481	50.514	-0.748	-1099.79
Total		22817	6332		81.632				

Table 8. Dealers With at least 50% Share in the Corporate, Municipal and Government Bond Markets, 1995-1997.

The revenues per dealer are calculated as the dollar value of the sells minus the dollar value of purchases over the sample period. The average revenue per transaction is simply the total dollar value divided by the number of transactions by the same dealer over the sample period.

Panel A: Corporate Bonds

Dealer	Rank	Number Of Trades	Total Market Value Of Trades ($ Billions)	Percent Of Trades	Cumulative Percent Of Trades	Total Revenue ($ Billions)	Average Revenue per Transaction $
Merrill Lynch Capital Markets	1	14505	43.868	9.296	9.296	14.840	1023.09
Morgan Stanley & Co., Incorporated	2	9809	36.020	7.633	16.929	11.721	1194.94
Goldman Sachs & Co.	3	9339	33.748	7.152	24.081	13.424	1437.44
Salomon Brothers Inc.	4	7770	31.692	6.716	30.797	6.834	879.52
Lehman Brothers Inc.	5	7538	29.015	6.149	36.945	8.137	1079.44
Credit Suisse First Boston Corporation	6	5474	21.935	4.648	41.593	6.708	1225.39
J.P. Morgan Securities Inc.	7	4977	20.355	4.313	45.907	9.502	1909.15
Donaldson, Lufkin & Jenrette Securities Corp.	8	6316	19.947	4.227	50.134	3.139	496.92
UBS Securities LLC	9	5254	19.669	4.168	54.302	2.430	462.51
Smith Barney, Inc.	10	7290	17.328	3.672	57.974	4.089	560.96
Total		78272	273.567				

Panel B: Government Bonds

DEALER	Rank	Number Of Trades	Total Market Value Of Trades ($ Billions)	Percent Of Trades	Cumulative Percent Of Trades	Total Revenue ($ Billions)	Average Revenue per Transaction $
Merrill Lynch Capital Markets	1	4492	16.611	7.430	7.430	4.369	972.52
Salomon Brothers Inc.	2	2505	16.479	7.370	14.800	3.124	1247.24
Lehman Brothers Inc.	3	2712	13.095	5.857	20.657	1.470	541.94
Goldman Sachs & Co.	4	1901	11.898	5.322	25.979	3.572	1879.24
Bear, Stearns & Co. Inc.	5	1759	10.134	4.533	30.511	3.332	1894.31
UBS Securities LLC	6	1574	9.178	4.105	34.616	0.539	342.52
Smith Barney, Inc.	7	3286	9.128	4.083	38.699	1.622	493.58
Morgan Stanley & Co., Incorporated	8	1466	8.159	3.649	42.348	0.757	516.70
J.P. Morgan Securities Inc.	9	1228	7.326	3.277	45.624	2.123	1728.73
Credit Suisse First Boston Corporation	10	1302	6.814	3.047	48.672	0.818	628.12
Greenwich Capital Markets, Inc.	11	932	5.832	2.608	51.280	1.216	1304.74
Total		23157	114.653				

Table 8 continued

Panel C: Municipal Bonds

DEALER	Rank	Number Of Trades	Total Market Value Of Trades ($ Billions)	Percent Of Trades	Cumulative Percent Of Trades	Total Revenue ($ Billions)	Average Revenue per Transaction $
Lehman Brothers Inc.	1	4646	15.371	9.511	9.511	6.327	1361.76
Merrill Lynch Capital Markets	2	5579	14.084	8.715	18.226	6.897	1236.28
Smith Barney, Inc.	3	5347	11.054	6.840	25.066	5.946	1112.09
Goldman Sachs & Co.	4	2901	8.873	5.490	30.557	6.380	2199.37
Bear, Stearns & Co. Inc.	5	2975	7.653	4.736	35.293	3.172	1066.29
PaineWebber Incorporated	6	4017	7.165	4.434	39.726	3.423	852.09
Morgan Stanley & Co., Incorporated	7	2370	6.768	4.188	43.914	2.482	1047.23
J.P. Morgan Securities Inc.	8	1732	6.523	4.036	47.951	3.328	1921.21
Prudential Securities Inc.	9	2142	4.333	2.681	50.632	2.685	1253.39
Raymond James & Associates Inc.	10	1869	4.076	2.522	53.154	1.140	609.72
Total		33578	85.899				

Table 9. The Bid-Ask Spread for the 10 Largest Dealers and Institutions and Others in the Corporate, Municipal and Government Bond Markets, 1995-1997.

We calculate the bid-ask spread per dealer (institution) per bond per day by subtracting the average sell price for each bond per day per dealer (institution) from the average buy price for the same bond over the same day by the same dealer (institution). We require at least one buy and one sell per bond per dealer (institution) within a day. The average spread per top-10 dealer (institution) per day is calculated by averaging the bid-ask spread per dealer (institution) per bond per day over the top-10 dealers (institutions). The average bid-ask for the non-top-10 dealers (institutions) is similarly calculated.

Panel A: The Bid-Ask Spread for the 10 Largest Dealers and Other Dealers

	TOP 10 DEALERS				OTHERS			
	N	MEAN	STD	MEDIAN	N	MEAN	STD	MEDIAN
Corporate	750	0.2571	1.1928	0.1489	1113	0.1330*	0.8284	0.0000
Government	560	0.0436	0.8117	0.0333	468	0.0887	1.5052	0.0127
Municipal	366	0.2043	0.3822	0.1203	637	0.1942*	0.4031	0.0803
Pooled across all Sectors	1678	0.1742	0.9466	0.1041	2218	0.1412*	0.9325	0.0000

Panel B: The Bid-Ask Spread For the 10 Largest Institutions and Other Dealers.

	TOP 10 INSTITUTES				OTHERS			
	N	MEAN	STD	MEDIAN	N	MEAN	STD	MEDIAN
Corporate	419	0.1374	0.8123	0.0000	1339	0.1477	1.1551	0.0000
Government	209	0.0374	1.3360	0.0217	907	0.0870	1.3391	0.0250
Municipal	144	0.2547	0.6159	0.1855	694	0.1576*	0.3506	0.0545
Pooled across all Sectors	772	0.1322	0.9565	0.0500	2940	0.1313	1.0909	0.0000

Note:

*: statistically distinct at the 0.01 level using a Wilcoxon sign rank test of equality of the medians
**: statistically distinct at the 0.05 level using a Wilcoxon sign rank test of equality of the medians
***: statistically distinct at the 0.10 level using a Wilcoxon sign rank test of equality of the medians

Table 10

Panel A: Bonds Traded by the 10 Largest Dealers and Other Dealers in the Corporate, Municipal and Government Markets, 1995-1997.

Market Sector	Distinct Bonds Of Top 10 Dealers	Distinct Bonds Of Remaining Dealers	Aggregated Distinct Bonds	Common Bonds	Common Bonds as a Percentage of Distinct Bonds
Corporate	610	1005	1615	130	8
Government	118	143	261	78	30
Municipal	367	664	1031	16	2

Panel B: Bonds Traded by the 10 Largest Institutes and Other Institutes in the Corporate, Municipal and Government Markets, 1995-1997.

Market Sector	Distinct Bonds Of Top 10 Dealers	Distinct Bonds Of Remaining Dealers	Aggregated Distinct Bonds	Common Bonds	Common Bonds as a Percentage of Distinct Bonds
Corporate	295	854	1149	43	4
Government	64	169	233	51	22
Municipal	95	578	673	3	1

Table 11. Characteristics of Bonds Traded by the 10 Largest Dealers and Other Dealers in the Corporate, Municipal and Government Markets, 1995-97.

Panel A: Corporate Sector

	Top-10 Dealers	Remaining Dealers
	Distinctive bond characteristics	Distinctive Bond Characteristics
	Median (Std. Deviation)	Median (Std. Deviation)
Annual Yield	0.0719 (0.0150)	0.0705** (0.0123)
Annual Duration	6.2160 (2.8787)	5.3719* (2.5701)
Annual Convexity	45.1072 68.6274	33.1960* 56.6898
Time to maturity (years)	8.0507 (8.7492)	6.5425* (7.0210)
Bond age (years)	2.3671 (2.9533)	3.2973* (5.6562)
Coupon rate	0.0750 0.0156	0.0770** 0.0140
Percentage of Moody's Investment grade bonds	85	89
Percentage of Moody's junk bonds	15	11

Panel B: Government Sector

	Top-10 Dealers	Remaining Dealers
	Distinctive Bond Characteristics	Distinctive Bond Characteristics
	Median (Std. Deviation)	Median (Std. Deviation)
Annual Yield	0.0646 (0.0066)	0.0667 (0.0075)
Annual Duration	4.5430 (2.9334)	4.3592 (3.4947)
Annual Convexity	23.3232 (61.5752)	21.4583 (74.7867)
Time to maturity (years)	5.6630 (6.6915)	4.9699 (8.1410)
Bond age (years)	5.3822 (4.6822)	3.6096** (5.5297)
Coupon rate	0.0688 (0.0166)	0.0690** (0.0118)

Table 11 continued

Panel C: Municipal

	Top-10 Dealers	Remaining Dealers
	Distinctive Bond Characteristics	Distinctive Bond Characteristics
	Median (Std. Deviation)	Median (Std. Deviation)
Annual Yield	0.0534 (0.0090)	0.0530 (0.0089)
Annual Duration	8.5660 (2.8565)	8.2420*** (2.8969)
Annual Convexity	85.6467 (65.3419)	79.9138 (61.7796)
Time to maturity (years)	10.8781 (5.8288)	10.5781 (5.8330)
Bond age (years)	2.6342 (2.9045)	3.1260* (4.3597)
Coupon rate	0.0563 (0.0096)	0.0570 (0.0096)
Percentage of Moody's Investment grade bonds	96	99
Percentage of Moody's junk bonds	4	1

Note:

The pairwise tests correspond to the "top 10" sample and the "Remaining Dealers" sample in each case.

*: statistically distinct at the 0.01 level using a Wilcoxon sign rank test of equality of the medians
**: statistically distinct at the 0.05 level using a Wilcoxon sign rank test of equality of the medians
***: statistically distinct at the 0.10 level using a Wilcoxon sign rank test of equality of the medians

Table 12. Is the Bid-Ask Spread Different for the 10 Largest Dealers anc itutions? The Corporate, Municipal and Government Bond Mark 19 ·1997.

The dependent variable is the bid-ask spread per dealer per bond per day denominated in dollars per $100 par value. The estimates and standard errors for parameter significance are obtained from a Generalized Method of Moments (GMM) regression. The p-values of parameter significance are in parentheses under the respective estimates. All coefficient estimates significant at the 0.10 level or higher are indicated in bold.

Independent Variables	Model 1	Model 2	Model 3
	Corporate Bond Market	Government Bond Market	Municipal Bond Market
Intercept	**0.55** **(0.0888)**	**1.3** **(0.0088)**	**0.38** **(0.0241)**
Time to maturity (years)	**0.02** **(0.0001)**	-0.01 (0.476)	**0.01** **(0.0464)**
Bond age (years)	**0.013** **(0.0332)**	-0.01 (0.7217)	-0.00 (0.7988)
Log of Buy Volume	**-0.05** **(0.0250)**	—	-0.01 (0.3660)
Log of Sell Volume	—	**-0.08** **(0.025)**	—
Top 10 Dealer dummy	**0.15** **(0.0017)**	-0.01 (0.8996)	0.01 (0.6718)
Moody's AAA and AA dummy	-0.09 (0.4263)	—	—
Moody's AA dummy	—	—	0.01 (0.7253)
Moody's A1 dummy	0.02 (0.8779)	—	-0.07 (0.1556)
Moody's A2 dummy	0.04 (0.6771)	—	0.04 (0.6440)
Moody's A3 dummy	0.09 (0.4059)	—	0.04 (0.5726)
Moody's BAA1 dummy	0.10 (0.3125)	—	—
Moody's BAA2 dummy	0.02 (0.8711)	—	—
Moody's Baa3 dummy	0.22 (0.2405)	—	—
Below Moody's A3 dummy	—	—	0.01 (0.8841)
Utility Sector Dummy	0.07 (0.3707)	—	-0.02 (0.5746)
1997 Transaction Dummy	**-0.07** **(0.0659)**	-0.02 (0.7744)	**-0.11** **(0.0001)**
Number of observations	1799	863	1005
Adjusted R-square (per cent)	2.38	0.93	1.72

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